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Editorial

MAN HAS BEEN CIVILIZED, in the sense of living and working together, for several thousands of years, longer than recorded history and far longer than most people realise. He has lived in an industrial environment for something less than 300 and, during the past few years, has experienced a snowball of technological progress which has jumped from steam power to atomic power within the lifetime of an individual. Is it any cause for wonder that progress in material things has outstripped our social structure? And is it any wonder that man is basically what he has always been?

Man is a predatory animal. If he wasn't, then he wouldn't be where he is today. Man has preyed, successfully, on every other form of life as well as his own. He still preys on all forms of life, including his own. This is so well recognised in our social structure that

every business is conducted on the lines that everyone else is dishonest. That is why Banks have vaults and grills, guards and an elaborate system of checking. That is why large stores employ detectives, why communities employ a police force and why nations have standing armies.

Man, as an animal, is utterly ruthless in taking what he wants for his own survival.

It has often been suggested that, as mankind progresses, he will become noble. Old literature is full of dream-world Utopias which show the millennium as a beautiful world peopled with God-like men and women, none of whom harbour a destructive thought. These worlds all suffer from the same basic flaw; they are totally unrealistic.

Competition, the struggle for personal advantage, has been the driving force of man throughout history. There have always been wars

and, no matter how high the technological advancement, wars continued. No weapon is considered too horrible for use against unarmed civilians, including helpless children and babies. Can we say that a high technology automatically brings nobility? The history of this century supplies its own answer.

Environment does not, of itself, bring nobility. Many a ruthless despot has been raised behind palace walls in the lap of luxury and attendance. Many a slave has shown more thought for others, true nobility, than his feudal lord. Does education bring nobility? Everyone knows that it is wrong to be cruel, both morally and criminally; there are penalties for wanton cruelty. And yet blood sports are encouraged by those who, apparently, have had the highest education.

But if neither education nor environment bring absolute nobility, how about example? Orthodox religions can provide the answer to that. All through history great teachers have risen and, by word and deed, showed mankind the

path to nobility. To think of others, to be kind, to embrace all men as brothers. The Saints also set their own examples, and we have saints among us today, men who, by their unselfish devotion to the prime ethics of human behaviour, are truly noble.

But the words of the great teachers have been overlaid with dogma; the old Saints were martyred, the modern ones usually struggle in abject poverty. Example, then, seems insufficient.

In fact, the only worthwhile system, other than the "you watch me and I'll watch you" of universal distrust, seems to be that of the carrot and the whip. The carrot tempts men to be good, for a man will be noble if he thinks he is going to get something out of it. The whip teaches him not to be bad; pain is a wonderful deterrent to ignobility. The only trouble is that such a system presupposes a supreme authority to use the whip and offer the carrot. But it works, no doubt about that.

Animals are trained that way.

E.C.T.

the

by JULIAN CARY

give-away
worlds



The problem wasn't to find new planets, it was to find people to settle on them —and stay settled

MARK CAMERON HAD always thought that it was a mistake for the reception room at ColTerm to be so comfortable. The theory was obvious: attract the people inside, let them study the murals and the moving tableaux, rest in the deep, luxurious chairs and sniff at tantalising scents. Then, when their spirit of adventure had been aroused, lead them gently down the path towards colonization. The trouble with the theory was that it just didn't work.

People came in all right. They came in to escape the wet or heat, to meet friends, relatives, lovers, to kill a couple of hours while waiting for a train or an appointment, or just because they had simply nothing better to do. But that was all. Their spirit of adventure just didn't seem to exist, and chasing it was a waste of time. Expensive time at that.

Mark sighed as he moved

through the reception room towards his office. Senator Colburn was due today, and it didn't require much imagination to guess why he was coming. Commander Jelks would listen, soothe, promise, and then tear hell out of his staff for not getting on with the job. And he would be right. With virgin planets just waiting to be colonized, with the big hyper-drive ships ready and waiting to take out those colonists, with all the resources of Colonial Terminal behind the project it was still failing.

There weren't enough volunteers. The volunteers they did get were falling down on the job. Time, as both Mark and the commander knew, was running out. Either ColTerm produced and did it soon, or the entire project would be financially starved to death, the star-ships, remodelled for scientific exploration and man's big

chance would have gone by default.

Mark squeezed past an elderly couple and halted by a mural. It showed a rolling landscape of beautiful lawn spotted with exotic flowers. Trees misted the horizon and fleecy white clouds drifted high against an azure sky. Aside from the twin suns it could have been a scene from Earth. It wasn't; it was supposed to represent Deneb Five. It wasn't representative, either, any more than a cultivated garden was representative of tropical jungles.

A young couple were studying the mural, and Mark glanced hopefully at them.

"Interested?"

"Uh?" The boy, a vacant-faced youngster with a pimpled skin, blinked and remained silent.

"That's Deneb Five," said Mark cheerfully. "Wonderful place."

"Where's the houses?" said the girl. She was a female counterpart of the boy, her make-up, if anything, making her appear even more vacuous. Her eyes became alive as she

stared at Mark, neat in his pearl-grey uniform edged with silver. She stared at him, letting her eyes drift over his craggy, unhandsome features, his shock of thick black hair, the creases of irritation between his eyes.

"They're building them now," lied Mark, and smiled warmly at her. "The colonists, I mean. There is quite a large settlement now, and it's growing all the time." He became confidential. "Just the place for a young couple to settle down. Plenty of space, plenty of sun and air. You'd enjoy every moment of it."

"Yeah?" The boy tugged at the girl's arm. "I guess so."

"No houses," said the girl. It seemed to worry her.

"Hicks," said the boy. "Who wants to live in the sticks?" He glanced at the wall clock and pulled at the girl's arm. "Come on, honey, we gotta get moving. Remo's real keen and we don't wanta miss the opening."

"Sure," said the girl, her eyes glued to Mark's face. "I guess you're right." They walked off without another word.

Mark glowered after them, knowing that he shouldn't feel anger, but feeling it just the same. He turned as a hand touched his arm. The hand belonged to a trim young blonde wearing a uniform similar to his own. She shook her head in mock reproof.

"Shame on you, Mark. Trying to vamp them in now?"

"Morons," he said bitterly. "Both of them."

"Forget them," said Susan. "They wouldn't have been suitable, anyway."

"Their applications would have boosted the files," he reminded. "With the Senator breathing down our necks we need all we can get."

"I've got some waiting for you." Susan smiled up at him as she led the way towards the office. "Things are looking up."

"Maybe." Mark didn't share her optimism.

Application was as simple as it could be made. If someone thought that they would like to become a colonist they filled in a form, sent it in,

and then Mark interviewed them for general suitability. If they showed promise they went through a further screening to eliminate undesirables. Not many showed promise.

Of the five people waiting in the outer office, three were single and the remaining two were a married couple. Mark glanced at their applications, pulled a sheaf of printed forms towards him, picked up a stylo and nodded towards Susan.

"All right, let's see what we've got. The singles first, any order."

The first was a man, thin, stooped, past middle age and with a harrowed expression. He closed the door almost furtively behind him and sat on the very edge of the chair.

"Name?" Mark remembered to smile as he asked the prime question.

"Hanorhan. Robert Hanorhan."

"Well, Mr. Hanorhan," said Mark cheerfully. "You want to be a colonist. Right?"

"I don't know." Hanorhan eased his collar. "That depends."

"Depends on what?" Mark glanced down at the application form. It was a shop-window gesture; the preliminary interview was always verbal, the printed forms not entering into the picture unless the applicant showed promise, but it served to hide his expression.

"Things," said Hanorhan vaguely. He seemed to arrive at a decision. "Look, mister, does Earth law extend to the colonies?"

"The constitution of each colony is based on Terrestrial Law," said Mark cautiously. "If you committed a murder, for example, you would be lobotomized." He smiled at the ridiculousness of Hanorhan doing any such thing. "The colonies are civilized, if that's what you mean."

"I don't," said Hanorhan. "Not exactly." He pulled at his collar again. "It's my wife," he explained. "The day we married she told me that I'd have to support her until she died. She meant it, too, and she's a healthy woman. Would she be able to grab my pay if I signed on?"

"Pay?" Mark looked

puzzled. "What makes you think that you'll be getting paid?"

"You expect me to work for free?" Hanorhan rose with outraged dignity. "What's the idea of advertising for people if you don't want to pay them?"

"You've got it all wrong," said Mark. He reached for a folder and handed it to Hanorhan. "Take this, read it and, if you're still interested, come back later."

"But——?"

"Show him out, Susan." Mark snatched up a rubber stamp and banged a big "rejected" sign on the application form. "Next!"

The next was a gangling youth who had distorted ideas of being given a planet of his very own, complete with slaves and a harem. He went the same way as Hanorhan. The one after was a withered spinster, who obviously was only interested in the colonies as a happy hunting ground for unattached males. Mark listened until she betrayed her firm resolve never to have children, and then rejected

her immediately. The couple, at first, seemed to make up for the others. They were young, intelligent and apparently sincere. They had read the preliminary folders, studied the murals and wanted more information.

"It's like this, Mr. and Mrs. Conway," said Mark. "Almost every sun has planets, and in most cases at least one of those planets is what we call an Earth-type world. That means that the air, water, gravitation and general environment is suitable for human life and that, as far as we know, there is no harmful bacteria. Those planets are waiting to be colonized."

"Sounds interesting," said Sam Conway. "What's the catch?"

"There is no catch." Privately, Mark wondered why on earth these people had bothered to read the preliminary literature. All the information they wanted was in them. "Naturally, we don't want to transport unsuitable persons to these new worlds, but that is the only restriction."

"Sounds good," said Julia

Conway. "How many colonies are there?"

"Three at the present time. Deneb Five, Sirius Two and Mirab Eight. We have about two dozen other worlds suitable for colonization, and we hope to get them going as soon as possible." Mark toyed with his stylo. "I need hardly stress the advantages of going to a virgin world."

"Why virgin?" asked Julia shrewdly. "Why not just build up the established colonies?"

"A good point," admitted Mark. He hesitated, knowing that he was treading on thin ice. "We do take people to established colonies if they are small and if they need building up. But our main object is to colonise as many worlds as quickly as possible. So we send out complete units of colonists, seeds, tools, everything they need to start a settlement. The rest is up to them. They buckle down, build houses, farms, raise stock and, naturally, increase." He smiled at the couple. "Children come naturally to young people in such circumstances."

"Do they?" Julia wasn't

interested. "Let me see if I have this right. You set down enough people and equipment to start a settlement and then leave them to it. Right?"

"That's about it."

"How about communication?"

"Ships call at regular intervals," said Mark. "They carry mail, tools, needed supplies, fuel for the atomic piles, things like that." He leaned forward across the desk. "Don't think that we just take you, dump you on a planet and then forget you. It isn't like that at all."

"I'd heard differently," said Sam.

"Rumours," said Mark quickly. "Discount them."

"About the living conditions," said Julia. "I suppose that we'll have prefabs and the usual utilities? Running water, electric light, video, things like that?"

"Eventually, yes."

"Why eventually?" Sam stared hard at Mark. "If you want people to colonize these worlds for you, then the least you can do is give them a decent standard of living."

"Mr. Conway," said Mark tensely. "Just what do you think a colony is? Do you think it a place like a small town? Or a village? Or even a small nation? Surely you read the folders and other explanatory matter?"

"Naturally." Sam dismissed the question with a shrug. "But, seriously, do you expect men and women to live like animals?"

"Certainly not."

"Then the utilities are essential." Righteous indignation entered his voice. "Personally, I wouldn't dream of taking Julia to a place without them. How would she fill in her time without video? What would there be to do after the chores were done?"

"Mark!" Susan had seen the mounting storm signals on his face. "Shall I finish this?"

Mark hesitated, his hand halfway towards the rejection stamp, then shrugged.

Susan took over before he could do more damage.

Five hundred feet above the city, Frank Durward stood

on a column of air and scowled down at the buildings spread below. They were tall and rectangular, neat and clean in their glass and concrete beauty. Between them the threads of streets ran in long, straight lines or swung in gentle curves. It was a pleasant sight to anyone who liked order and efficiency. Frank hated it.

He leaned against the guide-rail of the coleopter, his weight sending the little machine sliding down an invisible slope towards the terrace of a building. The parking space, as usual, was full, and his scowl deepened as he tilted the machine towards a clear, red-painted area. Cutting the power, he dropped, the opposed fans slowing and the jar-legs absorbing the shock of impact. Switching off the engine, he swung open the guide-rail and jumped from the platform. A man stared at him as he walked from the coleopter, seemed about to say something, then changed his mind.

He was late. Frank knew it, even before the robot time-clock swallowed his card

for dispatch to Personnel. The foreman halted him at the entrance to the assembly room.

"You're late, Durward."

"So I'm late. So what?"

"So you'd better watch yourself." The foreman breathed hard. "This is the second time this month. You want to get fired?"

"I'm not crying." Frank stared past the foreman to where the assembly belt moved down the length of the vast chamber. Men clustered about it, those coming on-shift relieving those going off. "Do I start work or don't I?"

"Go ahead." The foreman was reluctant to get a man into trouble. "But take a tip from me, Durward, get rid of that chip on your shoulder."

Frank shrugged and went to his place. The advice was good, he knew it, but knew, too, that it was easier said than done. He was a man whose body craved action, whose mind needed to be active, but the work he had to do provided scope for neither.

Before him a wide belt carried a series of incomplete

baby carriages. His job was to take a pair of wheels from stacks beside him and slip them on the near-side axles. The man further along finger-tightened a couple of holding nuts, the man beyond him tightened them with a wrench, the one past him put on the plated hub caps. Men on the other side of the belt performed the same service for the off-side.

The work required nothing but mechanical action. All along the line men worked for six hours a day, five days a week, assembling the carriages from the bare chassis to the finished product. The assembly belt determined the speed at which they worked, a buzzer signalled the half-way meal break and knock-off time. The men had long learned the art of letting their trained reflexes do the work while they talked or thought of other things.

"Saw the foreman chew you up, Frank," said the man on the left, the one who put on the holding nuts. "Second time this month, isn't it?"

"So what?"

"So if you get fired you

won't be able to keep up the payments on that new lift of yours." The man was envious. He had a wife and two children, and couldn't afford luxuries.

"I can live without it." Frank let his hands reach for the wheels, pick them up, slip them on the axles. Even this monotonous job required nothing in the way of competition. He would have worked at double the speed and not worried about it. "Anyway, there are other jobs."

"Where?" The man sucked at his teeth. "Bill got canned last month. You remember Bill? The guy who was going to write a book."

"I remember him." Frank did, a thin, stooped, weak-chinned individual who proposed to write a book which would turn society inside out. The fact that no one, aside from a few professors and students, read anything but the comic books now didn't seem to have worried him.

"Three times late so they fired him. He's still on relief."

"So now he'll have plenty of time to write his book."

Frank wasn't concerned about Bill. "I'll get by."

"That's what they all say." The man picked up a couple of nuts, one in each hand, spun them on their threads and reached for two more. "If you've got a couple of degrees or some relations in the right places you might, but not an ordinary guy." He grabbed more nuts. "Unskilled labour, that's us, and you might as well admit it."

"This isn't the only job in the world." Frank swore as he fumbled his wheels and broke his working rhythm. The nut-fixer waited until he had regained it.

"You ever heard of the black list? You get fired for bad timekeeping or as a troublemaker and you're on it. There are ten guys after every job now, and you wouldn't stand a chance." He grinned. "You'd have to surrender that lift, sell those fancy clothes, get rid of everything you own. Then you might get relief. Or they might send you to a government project. You ever talk with anyone who worked on one of them projects?"

Frank grunted, not wanting to talk about it. What the man had said was uncomfortably true. Men weren't really wanted in factories, not now. Automation had stepped in and did what had to be done faster, better, more efficiently than any human. And the same electronic machines had moved into offices and shops as well as factories. There wasn't a routine job a man man could that machines couldn't do better.

But men had to live. They had to be paid so that they could have money to buy the increased production of the streamlined factories, and so jobs had to be found for them. Jobs such as assembling baby carriages where they could do no harm. Careless workmanship didn't matter on a baby carriage, not as it did on a transceiver or a coleopter. But the workers were fully aware that they lived, in effect, on charity.

And charity and business have ever been strangers.

A buzzer sounded for the half-way break. The belt did

not slow; that would have been stupid, for it was more efficient for it to keep running, but the series of baby carriages came to an end. Frank slipped on the last pair of wheels, straightened his back and turned as a woman came down the aisle pushing a trolley loaded with containers of coffee and packages of sandwiches. She handed them out, one container and package to each man. Frank pressed in the top of the coffee container, stood it to one side while the built-in unit heated the contents and stripped the plastic wrappings from the sandwiches.

"What you got?" The nutfixer, his mouth full, gestured with his package. "Soybean butter and yeast-cheese in mine. Want to share?"

"No point." Frank examined his food. "Mine are the same." He bit into one, trying to enjoy it, but finding it hard. It was food, that was all that could be said for it. He had finished the sandwiches and was drinking the coffee when the foreman, his face dark with anger, came down the aisle.

"Durward! Do you park your lift in the restricted area?"

"Maybe." Frank was defensive. "Why?"

"The office has just phoned down." The foreman seemed really angry. "Damn it, Durward. You know as well as anyone that you aren't allowed to use the restricted area." He glanced at his wrist watch. "Get up there and shift it right away. If you're fast you can be back before the break's over. If you're not, then I'll have to book you in as being late on the job for the second time today. Move!"

Frank hesitated, then, gulping a mouthful of coffee, ran towards the exit. The foreman was trying to give him a break and he knew it. Twice late in one day meant immediate dismissal, and despite what he had said about work in general, he had no desire to test his job-getting powers. Even quitting a job made it difficult to find another; to be fired was almost economic suicide.

A man was standing beside

the coleopter when Frank emerged on the terrace. He stared coldly at the worker, then gestured towards the machine.

"Is this your lift?"

"I'm just going to move it." Frank swung open the guide-rail and mounted the platform.

"Answer my question. Is it yours?"

"Yes." Frank reached for the starting switch, acutely conscious of the passage of time. The man unclipped the guide-rail and immobilized the machine.

"Not so fast. I want to know why you parked here in the first place."

"Isn't it obvious?" Frank gestured towards the crowded parking space. "There just wasn't room anywhere else."

"That is no excuse. This area is reserved for top-grade personnel. Did you know that?"

Frank drew a deep breath. The man looked important, probably was important, but that didn't give him the right to throw his weight around. If he was amused at the cross-

questioning, Frank wasn't. He tried to control his instinctive anger.

"Look, mister," he said patiently. "I parked here. I'm sorry. I want to move my lift away from this area. Do you mind?"

"I mind very much," said the man. "I don't like your parking here, and I don't like your attitude. What do you think would happen if everyone disobeyed the rules and regulations as you did? Setting your lift down in the restricted area was in the nature of a calculated insult to any of the top-grade personnel who may have been inconvenienced by your action. It isn't good enough."

"No one was inconvenienced," said Frank, looking at the emptiness of the red-painted area. "And I've said I was sorry. Can I shift now?"

"All right." The man stepped back. "Don't do it again."

Frank fired the engines, revved up the twin propellers and, as they blasted air downwards, rode up above and with them. He leaned on the

guide-rail and sent the lift sloping over the communal parking lot. It was a small machine and all he needed were twenty square feet of free space. He couldn't find them.

The parking area ran for most of the distance around the terrace. It was a big building, and a big terrace, and the further Frank searched, the further he would have to travel to get back to the job. Frustration added to his irritation and he swooped low, sending up a cloud of dust from his air blast. An attendant yelled at him, waving him upwards and taking his number. Frank swore, conscious of more trouble to come, and then sent the lift skimming back to the one clear area on the terrace.

He grounded with a jerk which jarred his bones, cut the engines and jumped from the machine. Maybe the official had gone. Maybe he would be lucky for once and get away with something for a change. He wasn't. The man had obviously been waiting for him, sheltered from view between two parked machines.

He came forward, his lips thinned with self-conscious anger.

"I thought so," he snapped. "You deliberately returned when you thought that I had gone."

"There just isn't anywhere else," said Frank. He glanced longingly towards the entrance of the factory. "I went all over and couldn't find anywhere to set down."

"Insolence," said the man. "That's the trouble with you workers. We give you the best, pay you far more than you're worth, and then you get arrogant." He pointed at the coleopter. "Shift that machine."

"Shift it where?" Frank felt his anger mounting. The pip-squeak facing him represented all he hated in life, the rules, regulations, petty trivialities, smugness and frustrations. He began to walk away.

"Wait a minute!" The man jumped in front of him, his voice rising. "You heard what I said. You're going to shift that machine."

"Go to hell."

"What!"

"If you want that thing shifted, then do it yourself." Frank pushed past the man, headed towards the building, then halted as two things happened at once. The man grabbed at his arm and the buzzer sounded for resumption of work. In such circumstances there was only one thing left to give satisfaction.

The smack of Frank's fist as it met the jaw of the man who had cost him his job echoed over the entire restricted area.

Mark had often thought that, in an earlier age, Commander Jelks would have made a good buccaneer. He had the bluff, outward manner, the big red face and shrewd eyes. He also had a shrewd respect for his own welfare and wouldn't hesitate to throw anyone to the sharks if it would serve his purpose. Primarily he was a politician and was in command of ColTerm only through influence and the accident of having once attended the Space Academy at White Sands. Captain Murbash, on the other hand, was

just what he appeared to be, the modern equivalent of a sailor. He had the same calmness, the same long-view expression in his eyes, the same talent for weathering storms. From Jelks' expression Mark guessed that the recent storm must have been pretty hectic.

He glanced round the office, saw that, aside from the two men, it was empty, and closed the door.

"The Senator gone?"

"Left an hour ago." Jelks took a cigar from a box on his desk, tore off the end with his teeth, lit it and glowered through a billowing cloud of smoke. "He wasn't happy, Mark. He wasn't a bit happy."

"About the project?" Mark took a chair, lit one of his own cigarettes and waited for the commander to speak.

"What else?" Jelks took the cigar from his mouth, examined the glowing end, held it an inch from his mouth. It was a familiar gesture, a typical politician's trick designed to divert attention from the face of the man speaking. "Congress isn't

happy about all the money we've been spending. They say, and I agree with them, that we should have better results than what we have."

Mark dragged at his cigarette, bracing himself for what was coming.

"He called us inefficient," said Jelks. "He said that something must be wrong in the set-up for us to have failed in such a simple task. He even hinted that I was to blame." Jelks stabbed his cigar at an ashtray. "I tried to tell him that a man can't attend to everything personally, that he can only be as good as his staff. It didn't impress him."

"You should have sent for me," said Mark. "Maybe I could have convinced him."

"Convinced him of what?" Jelks lowered his eyebrows. "That he was right?"

"Of course not."

"What else? That he was wrong?" The commander shook his head. "I tried that, Mark: I tried in every way I knew how, but what could I do against the figures?" He sighed like a man who finds

his load almost too heavy to bear. "How many applications have you received this week?"

"Twenty-three."

"How many have been passed by you for higher processing?"

"Five."

"You see?" Jelks obviously imagined that he had made a point. "Colburn kept flinging those figures at me. Few applications and fewer acceptances. Damn it, Mark, surely you can do better than that?"

"You want me to go out with a gun and drag them in?" Mark hesitated, then glanced at the captain. Murbash was engrossed in making doodles on a scratch pad, apparently oblivious to the others. "Anyway, we have achieved some results. Deneb Five is going strong."

"Was going strong," corrected Jelks. "Tell him, Murbash."

"Deneb Five is finished," said the captain. He looked up from his pad. "I had to evacuate them on the last trip."

"Why?" Mark spoke around his cigarette to cover his agitation. He would have taken bets that the colony on Deneb Five was a complete success.

"They were dying," said Murbash. "I mean that in the broad sense. Three years ago I dropped two hundred men, women, enough tools and equipment for five times their number, seeds, stock, an atomic pile, weapons, everything and anything they could possibly need. A few months ago I returned. I evacuated fifty-two men and women and thirty children."

"Where were the rest?"

"Dead." Murbash drew more squiggles on his pad. "The wild life got most, feuding did for some, and others committed suicide. When I made contact I found the survivors huddled in a few prefabs living off stores. They had rigged the pile to provide power for an electric fence, had posted armed guards and were sweating it out until I arrived." He spoke as if it were an everyday occurrence.

"The captain dropped them

on Mirab Eight," said Jelks. "He couldn't bring them back here." He didn't explain why, but he didn't have to. With applications from potential colonists already as low as they were, to return the remnants of a colony would be to invite the closing of the project. Rumour alone did enough damage; actual statements and ex-colonists would be fatal.

"Mirab Eight won't last long," said Murbash. He drew more doodles. "And Sirius Two will go the same way as the others. I'll probably be bringing them all back on the next trip."

"You needn't sound so damn smug about it," snapped Jelks. "It's your living, too, remember." That was unfair and untrue. Murbash was assured of employment as long as the hyper-drive ships remained in service. Mark spoke before the captain could answer.

"Does the Senator know about this? About the colony on Deneb Five, I mean?"

"No." Jelks glanced at the captain. "I thought it best not to tell him, and Captain

Murbash agreed to remain silent."

"Only until the next trip," said Murbash. "It'll come out then."

"That's not now." Jelks dragged at his cigar. "The position is this, Mark. You're in charge of getting new colonists and you're falling down on the job. Unless we can get more applicants and found a stable colony we'll be shut down." His broad red face became sombre. "I don't want that to happen, Mark. I don't intend to suffer for the mistakes of my staff. Understand?"

Mark understood only too well.

"What I don't understand," said Susan, "is why the commander is trying to keep the Deneb failure a secret."

"Jelks," said Mark bitterly, "is a twenty-four carat heel." He stared sombrely around the glittering decorations of the restaurant. An orchestra occupied a raised dais and played on instruments of sequined plastic. The sequins added nothing to the tone,

but, in the skilful lighting, the musicians flashed and glowed with prismatic colour. Other luminosities suspended from the ceiling or hung against the walls turned the night club into a fairyland of delight.

"Tell me." Susan had changed from her uniform and looked radiant in an off-the-shoulder gown. She lit a cigarette and blew perfumed smoke towards Mark. He waved it away, one strong hand toying with his glass.

"Did you contact Murbash?"

"He'll be along." Susan dismissed the captain with a wave of her cigarette. "What's with Jelks? Politics?"

"What else?" Mark glowered at a passing waiter. "Commander Jelks is one man who is going to come out on top no matter what happens. If we fail I get all the blame. If we succeed then he gets all the credit." He pulled a face as he swallowed his whisky. "The man's a rat, a clever rat, but a rat all the same."

"So he's a rat," said Susan.

"I'd agree with you even more if I knew what it was all about."

"An election is due," explained Mark. "Colburn made the Senate the last time by beating the colonial drum. He wants facts and figures to prove to the people that he's worth his keep. Unfortunately, we haven't got a nice set of facts and figures for him to show. Not that it matters. With the present interest in the colonies, he could say anything and get away with it. His main trouble is with the approbations committee; they are the ones who keep us in business. Follow?"

"There's to be an election," said Susan carefully. "Colburn is our man and, I assume, more or less our boss. His boss is the approbations committee. If he can't convince them we are doing our job then he will stop our funds. Right?"

"Right." Mark lit a cigarette. "Now Colburn knows that he's on a limb. He backed ColTerm and we haven't produced. At the moment he thinks that he still has to back us. ColTerm, in a way,

is his baby. But if he should learn of what happened on Deneb Five, he'll see the chance to make a switch. He'll kick us overboard and come out as a champion of the poor unfortunate colonists stranded light years from home. With good publicity, he'll appear as a shining knight attacking the dragon of ColTerm. He'll win, we get no money, the colonies are evacuated and the big dream goes down the drain."

"And Jelks?"

"He'll blame me for the failure, turn his coat, weather the storm and probably wind up as head of the repatriation organisation." Mark pointed with his cigarette. "But me, you, the others, will all be out of work and looking for relief."

"I get it," said Susan. "At least, I think I do. But why has Jelks kept the Deneb business a secret?"

"Jelks is in a soft job and he wants to keep it. It would pay him more for ColTerm to succeed than to fail. Political shake-ups are always to be avoided if possible, and Jelks knows it. So he's keeping his

fingers crossed and making me the patsy. If I can't improve things then he'll confess to Colburn. If I make a go of it, then the Deneb failure won't matter."

"You'll make a go of it." Susan smiled at him, and then, as she glanced over his shoulder, lifted an arm in greeting.

Captain Murbash, looking uncomfortable in his civilian clothing, eased a cautious way between the crowded tables. He looked relieved as he saw Susan and slumped into a chair with an audible sigh of relief.

"Some place." He looked around the night club with a vague air of wonder. "Do people really like coming to these clubs?"

"They try to imagine they do." Mark snapped his fingers at a waiter and gave the order. He smiled at the captain after the man had gone. "I've ordered the speciality of the house, genuine meat steak. I hope you've no objection?"

"To meat?" Murbash shook his head. "I'm a realist. Man is an omnivorous creature,

his teeth prove it. I'll eat anything edible, anywhere." He looked almost cheerful. "Steak, eh? The last steak I had was on Deneb Five. Good, too."

"Deneb Five," said Mark slowly. "Just what did happen there, captain?"

Murbash grunted and began to make doodles on the menu. He drew a circle, a spiral, another circle. He was either deaf or didn't want to answer the question, and Mark knew that he wasn't deaf.

"Bacteria?" Susan knew better, but she was trying to be helpful. "An epidemic they couldn't handle?"

"Would I be here if it had been that?" Murbash looked at her from under his eyebrows. "There was no epidemic."

"Are you sure?" Susan switched on all her charm. "I mean, couldn't the survivors have been afraid to tell you for fear that you might have abandoned them?"

"They had four doctors and equipment for a full-sized hospital," said Murbash evenly. "I have three doctors

on board my ship and everything they need for testing for harmful bacteria. In any case, the first exploration ship gave the planet a clean bill of health. Bacteria isn't the answer."

He looked up as the waiter returned with covered dishes, and Mark shelved the subject. Murbash had the answer, or part of the answer, as to why every colony so far founded had broken down or was in the process of breaking down. Jelks, with his customary bull-headedness, had probably not even read the captain's reports. What he didn't think worth passing on was left to rot in some forgotten file. Mark, now that his own interest had become strictly personal, wanted to find out as much as he could as fast as he could. Murbash could tell him more than any reports.

If Murbash wanted to.

The hover police caught him just as dusk was stealing across the city. Frank swore as the flying platform came swooping towards him, its signal lights flashing the command to halt-and-hover. He

ignored them, his eyes searching the web-work of lights and darkness below.

He hadn't really expected to get away with it, but as time passed he had begun to hope. He'd flown fast and far in his lift, feeling some of the irritation and frustration die as he wheeled and soared high above the city. He'd even ventured out of the coleopter flying lanes, travelled far to the north, where he'd landed, eaten a meal, refuelled and spent a little time wandering the streets. Now he was back, and the police, obviously, had been on the watch for him. Violence, while tolerated to a certain extent when confined to the low-income groups, was severely dealt with when it affected the elite.

The hover police came closer, their loud-hailer blasting the air with sound.

"You on the red lift! Halt-and-hover!"

"Go to hell!" Frank doubted if they heard him, but the defiance was his own personal kick against authority. He threw his weight against the guide-rail and the little machine slipped sideways

and downwards towards the illuminated terraces below. After it came the flying platform, its signal lights blazing, the loud-hailer roaring commands.

"Halt or we fire!"

That was bluff, Frank knew. Shooting down coleopters from the sky wasn't a practical proposition when over a city. A human body could do a lot of damage plummeting down from a height of several hundred feet, not to speak of the crashing coleopter itself. But the police didn't rely on mere threats. The loud-hailer fell silent as the platform drove forward with a roar from its fans. It swooped above Frank, steadied, then dropped down towards him.

The tiny lift, meant to carry no more than the weight of a man, tipped and bucked as the column of air from above thrust down at it. Desperately, Frank speeded his engines, but their power was weak compared to those of the platform. Like a moth pressed down by an invisible thumb, the coleopter descended to the streets below.

Anger made Frank risk

suicide. His vehicle was nothing but a circular wing surrounding opposed fans and rode on a column of air. The direction of flight was governed by the weight of his body, the speed of the engines by a simple control. Used with discretion, the coleopter was as safe as an old fashioned bicycle. He threw discretion to the winds.

The machine tilted as he threw his weight to one side. For a moment the thrust from above was unopposed by the thrust from below and he fell, sickeningly, towards the city. Frantically, he threw himself towards the opposite side, managing to restore equilibrium just in time, then, before the flying platform could catch up with him, sent the lift thudding down on a terrace. He had cut the engines and was inside the building before the hover police could land.

The building was an entertainment centre, a tall, many-roomed hive filled with bars, dance floors, tri-dis, slot machines and people on the loose looking for fun. Each floor had its own turnstile

and Frank sweated as he thrust coins into the slot, waited for the barrier to click, then headed down a corridor at a run. A man dressed like a clown grabbed at his arm and yelled something about a circus. Frank tore himself free. He wanted a drink, two drinks, and he wanted them fast.

He found them in a room filled with shadows and glowing with black-light decorations. A grinning skeleton behind the long counter thrust a lambent glass before him as Frank dropped on a stool, pointed to a sign which stated that each drink was two credits, took the money and glided off. The beaker had tiny designs buried in the glass so that, as he looked at it, faces seemed to wink and grin, smile and nod, their expressions changing as he turned the beaker in the invisible black-light streaming from hidden projectors.

"Cute, isn't it?" A humped shadow to his right lifted his own glass, swallowed, set it down empty. "Join me?"

"Give me time." Frank drank, letting the syrup-sweet

concoction slide down his gullet. "Now I'm ready. Thanks."

The shadow gestured, the grinning skeleton glided forward with two fresh drinks. Frank lifted his, gagged to the bite of sourness and slammed down the glass.

"What the hell?"

"Every drink an adventure," said the friendly shadow. "No matter what you ask for, you get what they give you."

"Tastetitivation," explained the grinning skeleton. His voice spoiled the illusion. "We've a kaleidoscope drink-mixer and no two can ever be the same. That's the speciality of the Cavern. Drinking here never gets boring."

"It could get pretty sickening, though." Frank tasted his drink again and shuddered.

"Sobup pills on request. Want to try again?"

"Why not?" Frank found money, dropped it on the counter. "Here's hoping."

The next drink tasted of oranges, the one after of apples, the third of distilled sewer water, but they all had

a high alcoholic content. By the time the floor show started both Frank and the friendly shadow had passed the critical stage. They watched, owl-eyed, as five tall superbly-built young women cavorted on the floor, the fluorescent paint they were wearing limning their bodies with coloured flame.

"Nice." Frank reached for his glass, missed, and suddenly felt irritated. "Damn joint! Let's get out of here."

"Where?"

"Anywhere. This place gives me the creeps." He slipped from the stool. "Coming?"

Together they weaved towards the door.

The friendly shadow had a name, Miles Whayland. He had a job, assistant professor at the local university. He held a degree in social engineering, another in psychology, and wanted to write a book. He told Frank all about it over a normal slug of Scotch in a bar which tried to emulate those common during the roaring forties. It did a good

job, too; the plastic really looked like wood, the cut glass and stacked bottles appeared to be the real thing, and the bartenders even wore side-burns and moustaches. The hostesses, on the other hand, strained the imagination. They wore fabrics unknown two hundred years ago and their figures betrayed the use of cosmo-surgery.

"Make-believe." Miles gestured around the saloon. "That's the trouble with the world nowadays; everyone goes in for make-believe." He helped himself to more Scotch. "You know why?" He didn't wait for an answer. "Bored, that's why. Bored and afraid."

"Who's afraid?" Frank wasn't looking for trouble. Alcohol usually made him genial, but he was irritated and conscious of trouble to come. "I'm not afraid."

"Didn't say you were. Society is, civilisation is, the world is." Miles caught himself and shook his head. "Man, the room's rocking!"

"Take a pill." Frank held out a dish full of the little white sobup tablets. Miles waved them aside.

"Later, not now. Money's short and I can't afford to get a glow on twice in one night." He glowered at his glass. "Money," he said distinctly, "is always short. Damn money, anyway, it's the invisible chains of the working man."

"Nice to be loaded," said Frank practically. "I could do with some more chains."

"What for? So you can worry about losing them?" Miles leaned forward. "Money doesn't make a man happy, Frank. And don't tell me that it lets you be miserable in comfort. I've heard that one. Money is only worth what you can buy with it. Can you buy freedom? Happiness? Can you buy the right to spit in your boss's eye?"

"Sure." Frank wasn't interested. "Give a man enough money and he'll let you walk over him in hobnail boots."

"False Gods," said Miles. He burped a little. "I'm writing a book about it, Frank. I'm going to prove that civilization is rotten. In fact, I'm going to prove that civilization is doomed." He seemed to like the sound

of the word. "Doomed," he repeated. "Doomed."

"So it's doomed. I heard you the first time." Frank twisted his head and stared around the saloon. No uniforms. He tried to relax. "How?"

"How what?"

"How is civilization doomed?"

"Simple." Miles suddenly became the lecturer he was. "Civilizations follow certain trends. They grow, expand, and then die. History is full of examples. Crete, Greece, Rome, Egypt, the Hittite Empire, China, the Aztecs, take your pick. They all follow the same pattern."

"Savages," said Frank. He had seen tapes dealing with the old civilizations. "Horse and sword barbarians."

"Not on your life. They had horses and swords and a slave economy, but what they did with those things you wouldn't believe. Plumbing equal to our own. Good roads. The Pyramids. Social structures and organisation as good as any known. But they all went the same way. They all died."

"Dead and forgotten," said Frank. "Dust to dust and all that. Have another drink."

"You don't take me seriously," said Miles. "No one takes me seriously. I don't suppose anyone will even read my book when it's finished." He looked as if he were about to cry in his Scotch.

"All right," said Frank patiently. "Why did they die?"

"Rot," said Miles. "Internal decay." He gestured around the make-believe saloon, the crowd of men and women all drinking, smoking, trying to convince themselves that they were having a good time. "Just like us. Too much time and not enough to do. The people lost their drive and began to amuse themselves with toys. Circuses in Rome and tri-dis now. When they got too weak the barbarians moved in and took over. They smashed the old civilization and built a new one." He paused, staring at his drink. "The trouble with us," he said suddenly, "is that we've got no enemies. There aren't any barbarians to move in when we've fallen low

enough. So we'll keep going down, down, down." His big hand slammed against the table. "Finish!"

"Tough." Frank finished his drink, reached for the bottle, then stiffened as two men came towards his table. They pressed impatiently through the crowd, their faces hard, their eyes matching their faces. They halted beside the table and stared down at Frank.

"All right," said one. "You've had your fun. Now get up and come with us."

"What's this all about?" Miles stared at the uniformed police, then at Frank. "What's he done?"

"Broke his manager's jaw and then evaded arrest. My guess is that he'll get thirty days doubled." His hand fell to his belt as Frank surged to his feet. "Take it easy."

Frank ignored him. The drinks he had taken had dulled his reflexes and depressed his censor. A lifetime of conditioning to obey the law and do as he was told went overboard as he thought of the injustice of it all. Sixty days for nothing!

He pushed against one of the officers, punched the other in the mouth and was half way towards the door when the police got their stun-guns working. He fell, numb from the waist down, tried to save himself with his hands, failed and blacked out as his head hit the edge of a table.

Miles poured himself another drink.

Murbash was enjoying himself. The steak had been as he liked it, seared on the outside and full of blood. The drinks had been good, too, good and plentiful, and after the meal he, Mark and Susan had gone on a tour of the entertainment centre. Susan had walked close beside him, her arm tucked through his, and Mark, even though he knew she was doing it for him, had felt jealousy. Privately, he decided that if Murbash was going to talk he had better do it fast.

Murbash halted outside a tri-di and looked at the barker. The man, aware of attention, yelled his wares even more loudly than before.

"Step right in, folks," he encouraged. "The realism will shake you. A real old-fashioned auto accident just like they used to have all the time. A suicide jump from the Empire State. A double programme which will have you sweating in your seats. Roll up! Roll up! Programme just about to begin."

"What's this?" Murbash looked at Susan, but it was Mark who answered.

"A thrill theatre." He dug money from his pocket. "Let's get inside."

The theatre was a small one, no more than a hundred seats surrounded by a 180 degree screen. From the roof countless threads of transparent plastic hung before the screen, giving, when the projectors were operating, a total illusion of depth. A few couples occupied some of the seats, the girls giggling and clutching the boys. A scattering of more mature people made up the rest of the audience.

The doors shut, the lights dimmed, and the usual preliminaries commenced the

show. Murbash stared at the commercials, seemed about to speak when the coloured images vanished and the programme started.

It was cunning, realistic and quite effective. The scene was the interior of a car and the camera was the driver. The effect was that each viewer was actually in the driving seat, staring through the windscreen and seeing the road unroll before the smooth bonnet. From the speakers came a low rushing noise, the simulated passage of air over the car and, as the speed increased or slackened, so the seats pressed or yielded against the backs of the audience.

For the first few minutes the scene was just that of a car rolling along the highways, humming around curves and bends. As Mark knew the preliminary stage was important only to instil the illusion, and despite his knowledge, he felt his feet begin to press the floor, his hands to clutch at an invisible wheel. The rest of the audience ceased to have any reality, only the screen and the im-

pression that he was actually driving a car were real.

The speed mounted, the humming grew louder, the tyres sang as they rounded curves and other cars slipped past as they were overtaken. The road wound ahead, a line of traffic on the near side, and the camera swung outwards to pass them. Mark tensed, noticing that forward vision was occluded by the bend of the road and that, if anything were coming the other way, a crash would be inevitable.

Something was coming the other way.

A heavy truck came into view, swept towards the audience. Tyres screamed as brakes locked and the scene wavered a little. Mark groaned, his foot hard against the floor, and then, as the truck rushed towards him, threw up his hands to protect his face.

The sight, sound, and impression of actually hitting the other vehicle was so real that women screamed and men yelled as they threw themselves from their seats. The screen went dark, the

lights went out and ultrasounds caused bones to ache. A smell of antiseptics wafted through the theatre and the groans of the audience showed that they had followed the illusion through past the crash and into the operating ward.

Murbash blinked as the lights came on. He was pale and his hands trembled a little.

"That was real," he said. "Too damn real." He shuddered. "How did they do it?"

"Fixed a camera into a car and actually crashed it by remotecontrol." Mark grinned at Susan. "This was weak to some I've seen. Maybe the next one will be better."

The next item was the suicide jump from the top of the Empire State. The illusion was first instilled and then, after a few moments, the camera dived towards the ground. There was no trickery about it. To the audience it was exactly as if they had jumped from the building. Below them the city grew as they neared the ground and Mark felt the terrible revulsion, the regret at having jumped,

the fear of the final crash. He felt his stomach churn as the street expanded before him, the speakers carried the sound of droning wind, and he fell, faster and faster, to the concrete which waited to smash him to a pulp.

Faster, nearer, so close that he could see the white faces of people as they stared at him, the thin lines between the paving stones, a scrap of paper, a wad of discarded gum.

When the lights went out he was pressed hard against the back of his seat, his hands extended before him, his every cell cringing away from the impact.

"I need a drink." Murbash was sweating. "I need a drink bad."

"And me." Susan tried to smile as they rose from their seats. "One thing is certain. I'll never commit suicide that way. Never!"

"You already have," pointed out Mark. "In every way but the actual death, of course." He rubbed his moist palms on his handkerchief. "That's what makes the thrill

theatre so popular. All the realism and none of the risk."

"I wouldn't like to bet on it." Murbash was thoughtful as they filed outside. "A person with a bad heart could succumb to the shock."

"They did, and do," said Mark. "That is why they had to be careful in the old days. The technique of dropping a camera from a roof is an old one; the tri-di screen and other effects only add to the illusion. But you can't stop progress, and every theatre carries the usual warning. If someone with a bad heart wants to take the risk, then that's up to them." He paused outside a replica of an old-time saloon. "This do?"

"If they sell Scotch, anywhere will do." Murbash led the way inside.

There appeared to be a little trouble at one of the tables. A couple of uniformed police stun-gunned a man and carried him out. Susan stared towards the scene and frowned.

"I believe I know that man."

"The criminal?" Mark sat down, snapped his fingers at one of the imitation dance-hall girls and ordered a bottle of Scotch. Susan shook her head.

"Not him, the other one." She stared even harder. "It's Miles Whayland. I haven't seen him for years." She smiled at Mark. "Would you mind? We used to study anthropology together." She was gone before he could object.

Murbash broke open the bottle, poured two glasses full of the liquid gold, drank, set down his glass and stared after Susan.

"Nice girl."

"Very nice." Mark lit a cigarette, wondering if modern sailors followed the traditions of the old seafaring man.

"You going to get married?" Murbash smiled as if guessing Mark's thoughts.

"One day, perhaps."

"Make it soon," advised Murbash. He rolled a little of the Scotch around his tongue. "Now that we're alone, what's on your mind?" He smiled at Mark's expression. "I'm just

an ordinary spaceman, but I know when I'm being pumped. You want to know something. What?"

"I want to know why the colonies are failing," said Mark. "I've read the reports, those Jelks has released, but they say nothing. I'd like your on-the-spot opinion."

"Simple. No guts."

"What?" Mark looked blank. "What do you mean?"

"You're sending out the wrong types." Murbash was obviously trying to be patient. "During the trip out I get to know them pretty well, and I know that they won't be able to make a go of it. We even run a pool on how long they'll last. I've never lost yet."

"I can't believe it!" Mark stared at the captain as if he doubted his hearing. "Those colonists are chosen on the basis of factors determined by experts. High intelligence, some acquired skills, physical and mental health, willingness to go." He checked the points on his fingers. "According to the experts they should be able to settle down like bugs in a rug."

"Then the experts are wrong." Murbash helped himself to more Scotch. "I know. I've seen them, these precious colonists of yours. I've lifted them from their own mess and had them crying on my shoulder." He pursed his lips. "Deneb Five, now, they almost went crazy with joy when we landed. They almost went crazy when I dropped them on Mirab Eight. It would have been pitiful if it hadn't been so sickening."

"The wrong types," said Mark slowly. It confirmed something he had long suspected. He remembered all the promises he'd had to make, the lies he had told, his own convictions that people who demanded much would not be content with little.

"That's right," said Murbash. "No guts."

"You've known this for a long time," accused Mark. "You must have done. Why didn't you tell someone before?"

"No one asked me," said Murbash blandly, but Mark knew it wasn't just that.

Murbash was a starship captain. His job was to obey orders, and if he wanted to keep his job that's all he had to do. Mark opened his mouth to say something, then closed it again as Susan, accompanied by a stranger, came towards them.

"Meet Miles Whayland," she introduced. "Miles, this is Mark Cameron, my boss, and this is Captain Murbash. Have a drink."

"Thanks." Miles plumped in a chair and it was obvious that he'd already drunk enough. He must have thought so, too, for he grabbed a couple of sobup pills, swallowed them, and waited for them to take effect. While waiting, he helped himself from the bottle.

"Science," he said. "It's wonderful. Rome had the vomitorium and we have sobup pills. Drink yourself stupid, take a couple of little white tablets, and then you can start all over again." He blinked, the rapid effect of the pills already apparent in his eyes and voice. He raised his glass. "Here's to progress."

"Clear jets." Murbash answered the toast. "You call this progress?"

"Why not? Progress is progress no matter in which direction we're going. We just happen to be going down. Like I was telling poor old Frank, you saw what happened to Frank? Stun-gunned the poor unfortunate so and so. Will he be sorry." He brooded about it, knowing that the pain of returning circulation and feeling after stun-gunning was something most men would do anything to avoid. He sighed, took another sobup pill and washed it down with a drink of whisky.

"Miles is a social engineer," said Susan brightly. "He knows just what is wrong with civilization, don't you, Miles?"

"Rotten," said Miles. "Rotten and doomed." He blinked at the others. "No barbarians," he explained. "No one to move in when we're finished and infuse new blood and life. Always before there have been barbarians to take over when a civilization has passed its prime. But not now." He

burped. "I've worked it all out," he continued. "Used one of the computers to extrapolate the trends and come up with the answer. Finish."

He blinked seriously at the others.

The university was on the edge of town, a small place catering for the diminishing few who still evinced an interest in history, reading and higher learning. A jump-cab dropped them at a side gate and they stood, shivering a little in the cold night air, as Miles fumbled with keys. He opened the door just as rain began to patter down from the heavens. Mark glanced at his wrist watch.

"Five minutes late," he said. "The weather boys are getting careless."

"Come inside," said Susan sharply. She didn't want her dress to get wet. "Got any coffee, Miles?"

"I've got some Scotch." Murbash lifted the bottle. Of them all, he was the most affected by what they had drunk, probably because he

was the only one who hadn't taken the precaution of swallowing some sobup pills. In fact, he had refused, saying that a drunk wasn't a drunk without a hangover. Mark suspected that the captain didn't know what a real hangover was; that, or his constitution was so hardened to alcohol that he didn't suffer as normal men did. His respect for Murbash was increasing all the time.

Miles led the way to a cluttered office, switched on a percolator, found cups, a tin of cream and a box of sugar. He thrust them towards Susan, swept some papers from a chair and sat down.

"Were you serious about what you said, Mark?"

"Sure." Mark produced cigarettes, handed them around, lit them and blew smoke towards the glow-light. "I may be old fashioned, but the prospect of the collapse of civilization depresses me. I want to see your proof."

"Me, too." Murbash hefted his bottle and looked impatiently towards Susan. "How much longer for the coffee?"

"Won't be long." She stared interestedly about the office. "This where you work, Miles?"

"Yes. Crummy place, isn't it?"

The boiling of the percolator saved Susan from the necessity of finding an answer, and she busied herself with cups, sugar, cream and scalding coffee. Murbash added to the potential energy of the brew with the contents of his bottle, then sat back, smiling at the charts hanging against the walls.

"To work," said Miles and reverted to the lecturer. "When we deal with a culture or society," he said, "we are dealing with a group of particles, each of which is composed of a tangle of variables. Fortunately, while we cannot predict the actions of any individual, we can for a group of individuals." He riffled a heap of papers. "For example, we know that, of a certain group of people, a certain percentage will die within a certain time."

"Elementary," said Mark. "Assurance companies use such statistics all the time."

"Sure," agreed Miles. "Elementary, but important." He reached for more papers. "You'll have to take a lot of what I say on trust. I can prove it, but the proof requires time and the use of a Mitchell Computer." He chuckled. "I sneaked my own stuff in while making a market research analysis for one of our sponsors. I'll never understand why he didn't query the bill." He became serious. "Did I tell you about the pre-mechanical civilizations?"

"You did." Mark sipped at his coffee. "Take it from where you left it in the cab."

"All right," said Miles. "They all followed the same pattern of rise, decline and oblivion. No civilization which was overrun has ever managed to climb back again. A brief flash, perhaps, but that is all. Once they've had their moment they go out like a light." He looked at the others. "There is no reason to assume that our civilization will not follow the same pattern. Just because we use machines and have girdled the world with a network of communications doesn't make us superior to

our predecessors. It has only united us into one unit, and when we go, we go together. Follow?"

"I think so." Susan sat on the edge of the desk conscious of the figure she made in her slit-skirt, low-cut gown. "You said that basically we're no different from, say, Rome. They reached the top and crumbled, and where are the Romans now? And the Egyptians? And the Cretans?"

"Minoans," corrected Miles. "They called their island Minos."

"Don't interrupt. You said that they were all conquered and that the conquerors squashed them and built anew. Now you say that we're going the same way. Right?"

"Top of the class." Miles dragged at his cigarette. "The trouble is that the civilization pendulum swings as far one way as another. The higher the rise, the greater the fall. We rose fast, faster than any other civilization before us, too fast. Science has turned us into something like an old-fashioned rocket, and you know what happens to those.

They soar up and up and up, and then, when their driving force is exhausted, down they come to smash to pieces. The very technology which has lifted us so fast will be the very thing to tear us down."

"Progress," said Murbash. He seemed to be talking to himself. "No guts."

He consoled himself from the bottle.

The pattern was, if you could believe Miles, predictable, the end inevitable. The rocket had lost its driving force and there was only one way for it to go—down. The trouble was that everything he said was true. He emphasised each point, and there could be no denying the conclusion.

"We're soft," Miles said. "We've lost all necessity for struggle. The weak are taken care of and live beyond their normal span. The sick and diseased are healed and allowed to breed and pass on their tendency to weakness. We poison ourselves from early youth to the grave with

narcotics and stimulants. We eat pre-treated rubbish from cans, drug ourselves so that we can stand our environment and, at the same time, try to convince ourselves that we are living the best of possible lives." He snorted. "It's got to the point where neurosis is so common that to be a sane man is to be considered a crank."

"Progress," said Murbash suddenly. He had fallen asleep during the discussion, nursing the bottle as if it were his best friend. Now he woke with a start, made his comment and swallowed a mouthful of whisky. Susan reached over, took the bottle from him and set it on the desk.

"We'll need it for coffee," she said firmly. "You've had more than your share."

"Can't have too much of a good thing." Murbash ran his tongue over his lips. "You said coffee?"

"Men!" Susan busied herself with the percolator. "Just like babies. Feed them, soothe their tempers, let them sleep then feed them again." She glanced at her watch. "Goodness! It's getting on for dawn."

"It's been a long night." Mark lit one of his remaining cigarettes. "An interesting one, though. It's something to learn that we're a declining civilization."

"Oh, we'll last a while yet," said Miles. "But not as long as most people seem to think. With the general decline in intelligence morons will be normal and less technicians will be produced. We've already come to rely wholly on machines. Once they go, we go. Civilization, at the moment, is like a spinning top. Left to itself it will gradually run down, but should something give it a push—" He made a gesture. "From civilization to abject savagery in three easy generations."

"So soon?"

"Of course. Smash the machines now and could you rebuild them? Could you teach your children to smelt metal, start a fire, build a house? The struggle to fill your belly would occupy twenty-four hours a day, seven days a week."

"I see what you mean." Mark stared thoughtfully at

his cigarette. "And all this is inevitable?"

"Unless we have colonies, yes." Miles accepted coffee and smiled at Susan. "Colonies would provide the equivalent of barbarians. They would supply new blood, new enthusiasm, refuel, as it were, the rocket of civilization. Without them we are headed for cultural death."

"But we've got colonies," said Susan. "We've——" She broke off, looking at Mark.

"Trying to keep it a secret?" Miles shrugged. "Try if you want to, but I think I know the truth." He gestured towards his charts, graphs and papers. "The colonies are failing, aren't they? I'm a social engineer, remember, and I know people. I've been to ColTerm and seen the applicants. If you can build a colony from that material, I'll eat it."

"No guts." Murbash rose and stretched himself. "The boy's right, Mark. Right all along the line. You're sending out weaklings and they can't take it." He leaned across the desk, suddenly sober. "I'm

not so young as I was, Mark, and maybe I'm too long away, but I don't like what I find when I come home. Maybe that's why I drink too much, I wouldn't know. But we're offering mankind the universe on a plate and he's spitting it right back in our eye. Why, Mark? Why is ColTerm failing?"

"Why ask me?" Mark dragged at his cigarette. "Why not ask the colonists?"

"You select them, Mark," Murbash was quietly insistent. "You pick them out. All you have to do is to pick the right ones. You haven't done that. Why?"

"Correction," said Mark. "I pick the best we can get."

"Then the best isn't good enough." Murbash sighed and straightened from the desk. He looked suddenly much older than before. "Looks as if we're too late."

"We're not too late." Miles sounded positive. "The trouble with ColTerm is that it's run by politicians, not experts. I bet that you haven't even got a social engineer on the staff. Right?"

Mark nodded.

"Or an advertising man? Or a group psychologist?"

"No." Mark felt that he had to defend himself. "But we have the advice of the government experts to guide us. Our colonial equipment is first class, Murbash will tell you that, and we don't stint the supplies."

"The trouble with you," said Miles deliberately, "and with the so-called experts, is that they are too near the wood to see the trees. You offer potential colonists everything you can think of to make life pleasant and comfortable, don't you? And yet you aren't getting enough colonists, are you? ColTerm is a failure, isn't it? Why?"

"Damn it!" Mark fought his anger. "Don't cross-question me."

"Sorry." Miles grinned. "I got carried away. But you know the answer, don't you?"

"Of course I do." Mark crushed out his cigarette. "I can explain it all right, it's the people. You can lead a horse, whatever that is, to water, but you can't make it

drink. You can offer new worlds and a new life to people, but you can't make them accept. ColTerm is failing simply because people don't want to leave home." He glared at Miles's expression. "What are you laughing at?"

"Remember what I said about being too near the wood to see the trees?"

"What's that got to do with it?"

Miles explained.

Commander Jelks sat at his desk and frowned down at the papers before him. He was worried. He liked his job and wanted to keep it and, if he could keep the Deneb fiasco secret, he would keep it. But if Colburn caught a hint of the truth he would reverse his coat, campaign for the closing of ColTerm, and Jelks would be out in the cold. The only other way to safeguard his position was to make the project such a success that it could stand on its own feet. With successful colonies founded on a dozen worlds he would be proof

against the fortunes of changing governments. But how to make it a success was something else.

The intercom hummed, he depressed the switch and snapped into the machine: "Yes?"

"Mr. Cameron to see you, sir." His secretary was duly respectful. "Are you engaged?"

"Show him in. Have you seen Captain Murbash?"

"No, sir."

"He's at my place." Mark entered the office and closed the door behind him. "I heard what you said over the intercom." He jerked his head beyond the door towards the secretary's office. "You should get those things toned down."

"I didn't expect you to listen." Jelks was cold. Undue familiarity with lower members of the staff was not to be encouraged. Especially when he was being prepared for a scapegoat.

"Don't worry about Murbash," said Mark cheerfully. "He won't talk about the Deneb affair." He sat down and lit a cigarette. "I've been

thinking about the ultimatum you gave me."

"Ultimatum?"

"Deliver or else." Mark gestured with his cigarette. "Let's not fence with words, commander; we both knew just what you meant." He relaxed, smiling, thinking of what Miles had told him only a few hours ago. Now that it had been explained the problem no longer existed. Instead, a new problem had risen; that of making Jelks see that his way was the wrong way and that Mark's suggestions would do the trick.

"All right," said Jelks. "You know the problem and you know my feelings in the matter. You're in charge of applications, and if you can't find colonists, then it's only fair to admit that you are to blame." He reached for a cigar. "Any suggestions?"

"Plenty." Mark smiled through his cigarette smoke. "In fact, I've solved the problem. I can get you all the colonists you need."

"You can? How?"

"Not so fast." Mark was enjoying himself. "First, com-

mander, just what is a colonist? A man or woman ready, eager and willing to start a new life on a new planet. Right?"

Jelks nodded.

"Now almost anyone will do for a colonist, providing they fit those specifications. Ready, willing and eager." Mark rolled the words on his tongue. "The trouble is that, up to now, we've concentrated on those who are willing to go. We didn't ask if they were ready and eager, only willing. That was one big mistake. Another is that we chose the wrong type of person." He pointed his cigarette at the commander. "Why haven't you volunteered for a colony?"

"Me?" Jelks looked astounded. "Are you serious?"

"I am."

"Well, for one thing my work is here. My friends, my home, everything I've worked for." Jelks looked impatient. "Is this to the point?"

"Very much so. You don't want to leave Earth because you'd be leaving too much behind. A perfectly natural reaction. But don't you see,

that is just where we've been making our mistake? We are asking people to give up what they possess and make a fresh start. No wonder they don't jump at the offer. Colonies can only appeal to those who stand to gain more than they lose."

"Now wait a minute," said Jelks. "If I follow you correctly, the answer is no."

"I was told that we couldn't see the trees because of the forest," said Mark. He ignored the commander's objection. "We are trying to select the best type of person for the colonies. Naturally, the best types, as far as we are concerned, are the decent, successful people around us. Good types all; if they weren't then they wouldn't be successful. That line of thinking extends to our choice of equipment for the colonies. We give so much because, subconsciously, we are supplying what we would want to have with us. So we are generous to a fault. That same generosity allows us to evacuate colonies when they run into trouble." He inhaled a lungful of smoke. "A perfect

case of the blind leading the blind."

"This is leading to something," said Jelks. "But I warn you that if you are trying to get my permission to ignore the government recommendations you are wasting your time."

"We've been wasting our time all along," said Mark. "You should talk with Murbash about our fine, upstanding colonists. They may have been successful here, but on the colonies they're a total loss. They go out to these new worlds and they can't take it. They miss their videos, their bars, thrill theatres, jump-cabs, police, all the rest of it. Not that we can blame them. What else can we expect? The poor devils are homesick and terrified of their new environment. So, instead of buckling down and building houses, farming, raising stock and children, they live on stores, huddle in the prefabs and spend all their time dreaming of Earth and the comforts they left behind them. They have only one real problem—to stay alive until the ship returns to

evacuate them. No wonder they failed. It would have been a miracle if they had done anything else."

Miles had explained it all and it had made such perfect sense. It was due to fear, of course, fear of the unknown. The volunteers had been reared in an environment which actively discouraged self-expression. To be an individualist was to be a crank, or worse. Civilization had smothered them and softened them with unending luxuries, so that when they had to stand alone they couldn't do it. Instead, they retreated into themselves, huddled in their tiny simulacrum of Earth, tried, in effect, to return to the womb.

Some, stronger than others, had managed to survive. Some had found escape in suicide, while others had found the same escape through ignorance, fear, or terror-induced hate. And with them they had carried the knowledge of what they had lost, all the toys and comforts they could never rebuild. The mistake had been in

assuming that success and stability in one environment automatically meant success and stability in another.

But it had taken a social engineer and a group psychologist to point it out. Mark, like Jelks, had been too close to the wood to see the trees. Too much a part of civilization to believe other than it was good. Too inclined to place his own standards of success on those going to a world where such standards couldn't apply.

"I want a free hand," he said slowly. "I want to throw the government recommendations overboard. Give me permission to do that, and I'll guarantee to make ColTerm a success within six months."

"No," said Jelks. "I won't do it. Once it's known that we're sending criminals out to the colonies I'll be broken."

"Before you go out on a limb," said Mark quietly, "let me finish. What makes a criminal? Boil it all down and the answer is that a criminal is someone who breaks a law. Who makes the laws? Not

the strong—they need no protection, but the weak do. So we have laws made by the weak to protect themselves against the strong. Laws about anything and everything, and the more laws the more law-breakers. We make our own criminals, commander, bear that in mind."

"But a colony formed of murderers and thieves?" Jelks shook his head. "I'd never permit it."

"Murderers are lobotomized," reminded Mark. "And thieves are usually pretty shrewd. But it goes deeper than that. What about all the tax-dodgers, traffic violators, those who are guilty of breaking some petty-fogging law? they are criminals, too, remember, and so they are barred from ColTerm. Barred together with those who are on relief because some 'expert' doesn't think that they would make good colony material. Barred with those of low I.Q., which is almost everyone not holding a degree and a good job. In fact, we've barred all those with most to gain and nothing to lose in favour of those with every-

thing to lose and nothing to gain. Crazy? You tell me."

"You tell the government," said Jelks. "I'm not going to stick my neck in a noose. If it ever got out that I'd permitted what you suggest then I'd be flayed by every paper and video hungry for news."

"Your neck," said Mark bitterly. "Damn it, man, this thing is more important than you or I, or any vote-catcher alive! The colonies have got to succeed! They've got to!"

He realised that he was shouting and controlled himself. Jelks wasn't interested in the big picture. Jelks was only interested in one thing—himself. Talking to him about history would be a waste of time. He wouldn't know about Tasmania, Australia and North America, all of which had, at one time, been used as dumping grounds for convicted felons. He wouldn't be able to grasp the concept that criminal tendencies were not hereditary, but bred by a society which set up an arbitrary system of rules which no healthy, self-willed individual with a strong survival instinct could avoid breaking.

"Pioneers are people who want to escape," said Mark evenly. "They are people who aren't satisfied with what they've got and want something better. People who are running from persecution, boredom, the dragging round of monotony."

"But criminals!" Jelks didn't seem to want to talk about it.

"Criminals are also trying to escape." Mark paused, staring at the tip of his cigarette. "How about this, commander? You take a nice, long trip, say for about six months. Your health isn't all that good and you need a rest. Let me run ColTerm while you are away. What I do needn't concern you. Officially you won't be to blame no matter what I do. Well?"

"No."

"I'm sorry." Mark glanced around the office. It was a luxurious office. Jelks had seen to that. "It would be a pity to give all this up, wouldn't it?"

"What do you mean?" Jelks sat bolt upright in his chair. "Are you threatening me, Cameron?"

"You can call it that." Mark crushed out the butt of his cigarette. "I want Col-Term to succeed, commander, and I've reached the point where I don't much care what I do. You can give me the free hand I ask for or——"

"Or what?"

"The Deneb affair would raise quite a smell, wouldn't it? Those poor colonists, dying, dumped on Mirab by your orders just so you can remain in control of the project. A thing like that could blast you right out of the political picture if handled right. It could blast the Senator, too. You've both got enemies who would be only too happy to get the information." Mark smiled. "Eye-witness accounts, a statement from me, another from someone else."

"Murbash?" Jelks stiffened as he thought about it. "You wouldn't dare!"

"No?" Mark shrugged. "What have I got to lose? Carry on as we are and I get canned for inefficiency, Col-Term dies and I'll be on relief. The other way I can,

maybe, get myself a good job with the opposition." His voice hardened. "I mean it, commander."

Jelks believed him. Political manœuvring was something he was used to, something he had done often himself. He frowned as he assessed both sides of the picture. He could jump the gun himself and beat Mark to it, but that would mean the loss of his sinecure. On the other hand, if he played along and, incredibly, Mark succeeded, then the credit would be his. And he could always pass on the blame. He had no doubts as to his ability, if it came to the point, of being able to outwit Mark in the political game hands down.

"I do need a trip," he said slowly. "My doctors have advised three months at the Polar resort."

"Six months would be better."

"Three months." Jelks was definite, and Mark knew better than to argue. "By that time the figures should have justified your outrageous demands." He glowered at

Mark. "Now, remember, officially I know nothing of your intentions. As applications officer you take full responsibility for your selections." He relit his cigar. "Now get to hell out of here."

"One other thing." Mark paused by the door. "I'm taking on a new man, Miles Whayland. He's a social engineer. Right?"

Jelks signalled disgusted agreement.

Frank Durward walked slowly along the street from the prison. His incarceration hadn't hurt him; if anything he had put on weight. It was the future which worried him. As a worker he was finished. No factory would employ him with his record, and if they did the unions would object. While there were clean, decent, law-abiding men looking for jobs where did a jailbird come in? He didn't. He went on relief or on a government project. Most men preferred jail.

Frank halted, hands in pockets, feeling the few coins that were left to him. His lift

would have been impounded for non-payment. His apartment lost for the same reason, his clothes and other things packed and sent to a store where they would wait for him until he could afford to pay the charges. If he waited too long they would be sold to defray storage fees. He had almost reached the point of feeling sorry for himself when he noticed the stranger.

He was a small, seedy, poorly-dressed individual with a furtive air. He sidled up to Frank and winked.

"Just out, pal?"

"What's it to you?"

"Nothing." The man was hasty in his denials. "Just thought you might be interested in something." He held out a card. "Go to the ColTerm building, show them this card; it's worth a meal and a couple of credits, maybe more." He winked again. "What you waiting for, pal? What can you lose?"

Put like that it was logical. Frank accepted the card, slipped it in his pocket and strode towards the soaring height of the Colonial Terminal. He didn't hope for

much. He had once applied as a colonist and had been rejected for lack of acquired skills but, as the man had said, what could he lose? Anyway, it was a place to sit and rest and do some more worrying.

The reception room seemed different. Gone were the pastels, the soft, deep chairs, the sweet scents of pine. Now the air was full of the harsh reek of sweating jungles, the arid scents of primitive life. The murals and tableaux were different, too. Frank edged his way towards one and looked at it. The moving pictures in tri-di colour gave the illusion that he was staring through a window into another world. It was an alien world. Great, jagged mountains towered in the far distance, lush jungle reflected the green sky and, in the foreground, something moved.

Frank felt himself tense at the sight of the creature. It was big, scaled, all mouth, fangs and clawed feet. The monster shifted, and now Frank could see something lying just before it. A woman,

not the inflated, barely-dressed product of an advertiser's imagination, but a nice, normal, attractive girl. The beast moved towards her, saliva dripping from its jaws, its red eyes flaming. It extended a clawed foot, was about to touch her, to roll her and tear the flesh from her bones, when another figure appeared.

It was that of a man, dressed as a man would be in such a jungle. He held a rifle and, as Frank watched, he dropped to one knee, took aim and fired at the monstrous creature. Flesh and scales disintegrated beneath the impact of explosive bullets, the creature roared and threshed in his death-throes, and the man picked up the girl and stroked her hair.

It was a disappointment when the scene dissolved in a swirl of colour and the hidden projectors began to repeat the sequence.

"Better than the thrill theatre," gasped a painted girl to the man beside her. He grunted, his eyes gleaming as he watched the episode repeat itself.

"I'd sure like to hunt them

critters," he said wistfully. "I sure would." He hesitated. "Maybe?"

"Why not?" The girl led him towards a busy counter.

Frank sighed and glanced around the reception room. A snarling, lizard-like creature crouched in stuffed immobility beside a bowl of incredibly beautiful flowers. Every mural and tableau held its audience, and those who couldn't get a good view were staring at the printed folders lying scattered on small tables throughout the room.

The place certainly looked different to what he remembered.

An attractive blonde accepted the card the stranger had given him, and after glancing at it smiled at Frank as if she had known him all her life.

"Pleased that you came, Mr. Durward," said Susan. She handed back the card. "If you will step through that door Mr. Whayland will attend to you. Just give him the card."

Miles Whayland looked up

from his desk, stared, extended his hand. "I know you," he said, and searched his memory. "You're the man who was stun-gunned in the saloon a few weeks ago. Remember? We were drinking together."

"I remember." Frank sat on the proffered chair, accepted a cigarette and stared around the office. "You talked of death and doom." He chuckled. "Still think that civilization is finished?"

"Not now." Miles held out his hand. "You've something to give me?"

Frank handed over the card. Miles examined it, stamped it, dropped it into a slot.

"Touts get half a credit for every one they send in," he explained. "We've got them waiting outside the jails, in the relief offices and anywhere they might be useful."

"He said something about a meal and a couple of credits," reminded Frank. "Was he right?"

"We can give you more than that," promised Miles. "A job, a new life on a new world, take your pick."

"I'll take the job," said Frank. "I'd be bounced as a colonist. I tried before and was rejected. No skills," he explained. "And now I've got a record."

"Things have changed." Miles glanced at his watch. "Let's have lunch. We can talk about things while we eat."

The food was good, the drinks better, and Frank relaxed as Miles explained the new system.

"It's a one-way trip now," said Miles. "ColTerm isn't playing any more. We send you out, supply you with what you need and the rest is up to you." He gestured with his cigarette. "Naturally, we balance the shipments; a few technicians to run the power-equipment, doctors to run the medical services, people like that. We even provide a heap of hypno-tapes and tutors so that everyone can learn if they feel like it. But the majority of the colonists are plain, ordinary men and women who've had a raw deal and who want to make a fresh start."

"No coming back," said

Frank thoughtfully. "Is that good?"

"It's the only way. Once they accept the idea that there is no coming back, then they forget to be homesick. They don't sit down like a lot of old women and dream of Earth and the life they have given up. They buckle down and make the best of what they've got." Miles grinned. "And we've got another slant, too. We send out the men first, the women afterwards. On new colonies, that is, it gives the men something to look forward to, something to work for. And we make a charge for transportation."

"A charge?" Frank slumped in his chair. "That lets me out."

"It lets no one out." Miles became serious. "People don't value what they get for nothing. The charge is nominal and we let those with no money work it off by acting as touts or cleaners for a short while. The whole point is that people, if they are really sincere about going, won't change their minds because of having to pay a slight charge. If they work it off

then it gives them time to think it over."

"Like the pictures," said Frank. He was beginning to understand. "The moving things in reception. Make the new worlds appear tough and exciting and they will attract more people. Is that it?"

"Of course. The old way was all wrong. Colonists don't need to be wet-nursed, not the colonists we are looking for. Offering them what they already had was a waste of time. Offer them something different and they'll jump at it." He looked at Frank. "Well, what about you?"

"I don't know," said Frank slowly. "I just don't know."

"You'll go," said Miles positively. "Just give it some more thought and you'll see that there's nothing else you can do."

Frank didn't answer. He was thinking, remembering all that he would miss if he went to a colony, the complete new start he would have to make, the utter difference such a life would be. No running water, no video, no jump-cars, bars, tri-dis, clean, tall buildings, the humming

life of the city. Instead, there would be jungle and mountains and nature in the raw. Would he regret having made the choice? And if he did regret it, would the fact that he could never return worry him? Frank, like all those of his day and age, had been shielded from the necessity of making grave decisions. Rules and regulations had guided his life from the cradle and would continue to do so to the grave. Now that he was faced with a big decision he couldn't resolve it.

Miles, watching from behind a veil of cigarette smoke, guessed what was passing through his mind.

"Forget it," he said abruptly. "Don't worry about it. Just work for us instead."

"Work?"

"That's right." Miles produced a sheaf of cards similar to the one Frank had been given outside the jail. "Take these, sign the backs and pass them on to anyone you think might be interested in what we have to offer. Half a credit for everyone who comes in and ten credits a week basic. Right?"

Frank nodded, took the cards, left the restaurant. Miles watched him go, smiling and knowing exactly what would happen.

Frank would plunge to the dregs of the city, he would meet the broken men, the forlorn women living on relief or on the edge of the law. He would know the terrible frustration of modern civilization, of going hungry while the shops were crammed with food, of being tempted by luxuries beyond his reach. He would suffer the arrogance of petty authority, the bitterness of the have-nots, the

impotent anger of helplessness. He would be torn in the economic rat-race of civilization until, suddenly, he would realise that none of it was necessary.

Not while there were new worlds waiting to be settled. Worlds without the rules and regulations of a decaying social structure. Worlds where men and women could, for the first time in their lives, be really free. And when he realised that he would return to ColTerm and beg them for transportation.

And by that he would prove his sanity.



In any age a Pagliacci may sing, and find
himself living the tragic story of
the clown in love

So Lovely, So Lost

by James Causey

OPENING NIGHT. THE stage was starkly medieval, all sawdust and three rings and the glistening tightrope wires. From their cages beasts snarled and trumpeted. The ringmaster snapped his whip and bowed to the eight giant lenses that stared bleakly down. In back of those lenses was our audience. Sixty millions of audience, scattered throughout the hemisphere.

In the wings, Lisa trembled against me. I whispered: "Your cue."

She nodded, squeezed my hand.

The drums rolled.

Watching her move onstage, I wanted to cry. She was lovely. It was the way she moved like a hawk against the wind, the breathless lilt in her voice, the magic I'd taught

her. Next to me, Paul Chanin grinned. "Nervous, Midge?"

"No," I said. I'd never liked Paul. He was too smug, too sleekly handsome. I hadn't liked the way he'd been smiling at Lisa these last few days of rehearsal, or the way she'd smiled back. But Paul was good—for a human. He could do a one-armed *planche* on the high wire, he could cartwheel blindfolded over gleaming coals. And he could sing.

We went onstage together, Paul leaping lithe and splendid in crimson tights, me floundering clumsily after with my baggy pants and wistfully painted clown face, blowing kisses to the blazing arcs above, now weeping in mock fury as Paul made love to Lisa. Then I leaped thirty feet in the air and hung from

the tightrope by my toes. A big smile. Midge the clown.

Sometimes you can tell when a show's going over. It was that way now. Right from the beginning I knew we had them by the throat. The banks of Emotional Reaction lights above the arcs told the story. They shone a clear deep ruby, a good healthy sign of audience empathy, but I wasn't surprised. Our play was a combination of two primitive art forms, and it had everything, love, pathos, beauty. And terror. The finale was the best, when the Zarl escaped from its cage and almost caught Lisa. I killed the Zarl, singing *Duo pro Pagliaccio* as I died, my voice golden thunder.

Curtain.

Director Latham hurried onstage, clapping, his eyes wet with tears. "Splendid," he husked. "Magnificent, Midge! I think we've finally done it."

I squinted at the Reaction lights. They shone the steady crimson of approval. "Looks like a hit, sir," I said. "Those ancients sure knew their stuff. I hope it's not just novelty interest."

A shadow of worry touched Latham's pudgy face. "We'll know later. Coming to the cast party?"

I shook my head and grinned. "I've got a very special celebration planned. Just me and the wife. See you at rehearsal tomorrow."

I went backstage to find Lisa.

She wasn't in our dressing room. Puzzled, I went down the hall to Paul's dressing room, opened the door. "Paul, have you seen——" My voice trailed off.

I stared at them. Paul and Lisa.

"Oh, hello, darling," Lisa said softly. "Isn't it wonderful? Paul's proposed!"

"And she accepted," Paul said.

"Accepted," I said.

"It'll be so perfect," Lisa was radiant. "The three of us, together!"

"But we're androids," I whispered.

"So what?" Paul said happily. "You're actors, and that's what really counts. It'll be the best companionate marriage on record!"

I remember saying it would

be fine. I remember shaking Paul's hand and saying no, I couldn't go to the cast party, I had a headache. I remember stumbling back to my dressing room and wiping grease paint off and saying to the mirror: "*Et tu, Pagliaccio?*" I do not remember taking the pneumatic tube home, or getting into the inertialess lift to our apartment on the ninety-first level. Our apartment was nice. Five rooms with a glass terrace, a half mile above the city. I stood on the terrace looking at the surprise I'd planned for Lisa, the food, the crystal sparkling in the firelight, the wine.

My little surprise party.

I sat down and slowly opened the wine.

Why?

Paul was human, that was the answer. He could give Lisa that sense of solidity, of belonging. It's been twenty years since Emancipation, but humans still think they're doing androids a favour by marrying them. Even though androids are saving the race from suicide.

It was long after midnight when Lisa came in. She wore

a sheer pink evening dress and her hair was soft gold on her shoulders and her beauty was a knife twisting in my throat.

"Oh darling," she said. "You shouldn't have waited up."

"Where's Paul?"

"Home." She hesitated.

"We're taking out our companionate policy in the morning. Would you help him move his things?"

"Sure," I said.

"We'll be so happy, the three of us." Her blue eyes were tender. "Come to bed, darling."

"I'm not sleepy. Think I'll go for a walk."

I used to love to walk the city at night, staring morbidly at the hate bars, at the blood-red neons advertising violence and sudden death. I used to congratulate myself for not needing the hate bars, for not being a stinking human.

This time was different.

I stood in the rain, shivering, looking at the sign, *Joe's Hate House, Knives Only! Kill Like a Man!* It exploded in a crimson spatter of fire, now re-forming, showing a dagger in a clenched fist. I stared at that dagger a long

time. I was thinking about Paul.

Finally, I went inside.

My first impression was of a great dim grotto, lit by smouldering tapers. There was music, a discordant cacophony with drumbeats that made your flesh crawl. It was music out of the pit, the kind of music a Zarl would have written in its death-throes.

"Registration, sir?"

He was a fat little man in blue evening tunic who took my name, beneficiary, and ten credits admission fee.

"Spectator or participant, sir?"

His smile was jovial, but the little pig eyes were cold, dead. Those eyes watched a dozen deaths nightly. It was my job to stop those deaths, to wipe out the hate bars, yet here I was, an Actor Ninth Class, smiling awkwardly at him, saying: "Spectator, please."

He bowed, led me to the roped-off spectator booths. I ordered a drink and gazed at the participants with a sick fascination.

They sat quietly, faces rigid, staring into the bar mirror.

They drank with studied deliberation, eyes darting. A tall man in grey tunic suddenly threw his drink into a startled face. Steel flashed. There was a moan. Grey tunic fell to the sawdust-covered floor, writhing. There were shouts of delight from the spectators as two white-capped bartenders carried the body away. The drums blared.

"Not fast enough," said a voice at my elbow. "Eh, Midge?"

It was Director Latham.

"Surprised to see me here?"

His smile was wry. "For your information the show was a flop."

I moistened my lips. "Impossible. The Reaction indicators——"

"Novelty only, son." He looked old, tired. "Sure, it's a beautiful show. They'll watch it for a week, two weeks." He stared bleakly at the participants. "Then the snake pits again. We've failed."

His words sank in, numbly. I whispered: "We had a sixty million audience; it's all the quota council needs. They could enact legislation tomorrow——"

"And within a week the crime rate would be triple." Latham's voice was grim. "A man's life wouldn't be safe in broad daylight. People need emotional catharsis, the sight of blood. It's why hate bars are legal. It's why the council pours a million credits a month into our show, hoping to wean the populace, to educate them. But humans don't *care*. Why should they? Why spend a lifetime learning to write music when an android child can make you weep with a whistled tune?" His smile was infinitely bitter. "Man built better than himself. Now he's sorry, but it's too late. He needs the androids, the beauty they can give him, and he's ashamed to admit it. Here he meets himself on even terms. Our show needs some of this, Midge."

"No," I whispered. "I'll resign first."

"Will you?" His twisted smile. "You're not a free agent, mister. *The show must go on.*"

Five little words, quietly spoken.

But my head snapped erect. Those five words were a

trumpet blast, a joyous shout that stiffened the spine, that made you *glad* to be an Actor, proud of your heritage.

"Damn you," I said.

"Midge White, XQ9," he said sardonically. "X: white, Caucasian type. Q: special training from the creche, type superior. 9: Actor, the very best. You're good, Midge. You've got a baritone like an organ. Onstage you're passion and fire and storm. You can tear the heart out of an audience with a smile. You've got reflexes no human ever had, with twice the number of relay-nodes, heavier nerve fibres, instantaneous reaction time. You're the penultimate. You're theatre. And you're letting your audience down."

His voice was raw, a pleading whisper. "I'm only a director. You're the empathy kid, you know what the audience really needs. Give it to them."

"Sure!" I was shaking with a cold sick fury. "A few dead androids come curtain time! We can vote now; have you heard? If you prick us, do we not bleed——"

"Save it," he said wearily.

"So twenty years ago you got emancipated, so what? The council still reserves the right to manufacture special androids for emergency. Humanoid types to test new antibiotics. Initial landing crews for unexplored planets. Guinea pigs——"

"Slaves," I said stiffly. "Class Nines are different; we've got free will."

"Really?" His smile grew into a smirk. "The show must——"

"Don't!" I was shaking.

"Then think of something. Stick around, absorb some atmosphere." He clapped me on the shoulder. "We're counting on you, Midge. Good night."

I sat, drenched in hate, staring after him, at the greedy faces around me, the taut, hungry smiles. The participants section was still *à*s death. Nobody moved. Those figures at the bar sat rigid, hands on their knives, waiting.

I stood up. I was trembling. I walked through the gloom towards the crimson railing that ended the spectator's area. There was a soft col-

lective sigh behind me as I vaulted over the rail.

At the bar, no one moved. It was very still and there was only the crunch of my feet in the sawdust. I carefully chose a seat at the far end of the bar as the bartender came up, smiling.

"Suicide, huh, pal? No weapon?"

"Wine," I said.

He brought wine. Three stools away a little man in a brown business tunic turned his head.

"On the house," the bartender said cheerfully. "Under the rules you're allowed one taste before you become fair prey. We don't get many suicides here. Only a month ago——"

"Beat it," I said.

He moved away, hurt. I looked at the wine. The little man on my left moistened his lips and smiled.

"Made my first kill last week." His nervous titter. "Sometimes I wonder how we got along before the hate bars. Once I was headed for a crackup. Failure at business, love, everything. Now I'm a

new man, I'm *somebody*. Know what I mean?"

"You ever watch the telecasts?" I said.

"Pap!" he spat. "Tinsel propaganda, for children and old women."

I picked up my glass. His hand slid along the bar, towards his knife.

I sipped my wine. The little man's hand blurred. Steel glinted in the torchlight.

Any android's neural synapses are fast, and entertainer types are fastest of all. I plucked that knife out of mid air, and held it thumb and forefinger, two inches from my throat.

There was a soft moan of anticipation from the spectators. The bartender chuckled. "Very nice," he said. "Under house rules he's yours. Give it to him in the belly."

The little man's adam's apple quivered. "No," he babbled. "It's not fair! Did you see how he caught it? He's an android!"

The bartender's eyes glittered. "Are you?"

"Class XQ9," I said.

The crowd stirred and mut-

tered. Hatred coiled in the air like a live thing. I looked at the twisted faces, the snarls. I threw the knife, point-first, into the bar. It quivered.

"Get out," the bartender said.

I walked out. I wanted to vomit.

I was thinking about Paul.

I helped Paul move into our apartment next day. He was very cheerful, and Lisa was radiant. After they came back from registration, Paul carried Lisa over the threshold according to tradition, and winked at me.

I went for a walk.

That next week I lived in a kind of quiet madness. They were together always, between rehearsals, after the show, bright heads close together, smiling and holding hands. Lisa was very sweet to me, the perfect companionate wife. It was all very civilized, very fine.

I don't know when I decided to kill Paul. Maybe it was that afternoon after rehearsal when I heard them talking about me backstage.

"I talked to Latham this morning." Paul's smug voice. "The council's going to close the show soon."

Lisa's startled gasp. "But it's a wonderful show. Midge says——"

"Midge is old hat. Latham wanted him to change the script. He refused. The public wants action, sweetheart, not this watered mush we're giving them. I want you to divorce Midge."

"Paul!"

"You don't love him, you never did. Look, baby, Midge belongs in the past with the dinosaur and the opera and video. He can't adapt. Yesterday I got an offer to entertain at one of the best hate bars in town. Five hundred credits a week! We'll make it a team act. You and me."

Faintly: "Hate bars will be banned soon."

His laughter was ugly. "Not until Midge can give the public something better, and he doesn't know how."

"I'll have to think about it," she said.

I don't know how long I stood there after their voices died away. I remember moving

about the stage numbly, looking at the cages, the still trapeze, the empty clown ring. I felt dead, all dead inside. In one of the cages something moved. It was the Zarl.

We import Zarls from Callisto, especially for our show. Imagine an ecology gone mad, a complete anarchy of flora against fauna with one murderously dominant species, and you have the Zarl. This one rattled the cage bars, staring at me.

"How much longer?" it asked. Zarls are telepathic.

"Perhaps six hours. Eat your meat."

"It is drugged. It will dull my reflexes so that you can kill me."

"At least you have a chance," I pointed out. "Refuse to eat and you'll starve."

Zarls have a horror of starving. Its claws scraped restlessly. "I hate you," the Zarl said.

"You hate everybody."

"You most of all. You planned this. Each night a Zarl dies." It sniffed hopelessly at the meat.

I stared at the Zarl. Slowly the thought took form.

"Before you die," I said softly, "how would you like one final kill?"

The Zarl raised its muzzle and stared. Then it grinned. I had to look away.

"The human," it said. "The male. You hate him."

"Yes."

"You will remove the drugged meat?"

"Yes," I said.

It brooded unwinkingly. "Done," it said.

I remember that night. Lisa was so beautiful it hurt to look at her. She was fire and quicksilver, her song was sunlight and carnival, and April rain. I loved her so much I wanted to cry. I remember how we stood in the wings before that last scene, and the way she squeezed my hand and whispered: "Midge, I've been such a fool. I'm going to divorce Paul."

I could not breathe.

"I don't love him, not really." Her eyes were brimming. "I found out this afternoon what he really was. Quick, darling, there's your cue. Hurry."

"Divorce him," I said stupidly.

"You're onstage. I'll tell you all about it later."

I stumbled onstage. I wanted to scream at Paul, to warn him. I wanted to run to the Zarl's cage and bolt it tightly, but I am an Actor and I had no real choice. Midge the clown. Now singing, turning handsprings with the other clowns, juggling, dancing on the high wire. But the music was an ancient *Danse Macabre*, the song was a leaden dirge. It had been so unnecessary! Only a blind fool would have realised that Lisa's infatuation for Paul was but a temporary thing. She loved me. She would always love me. Fool, fool and murderer! And now too late.

For Paul and Lisa were standing in the centre ring singing their final duet while the Zarl crouched in its cage as the cage door opened and the Zarl roared.

The clowns scattered in mock panic. Lisa screamed.

It was all part of the act; the Zarl was supposed to lumber from its cage in a drugged stupor. It would lunge feebly

at Lisa and I would slay it.

But the Zarl moved fast, fast. Lisa screamed again as it came at her in a feral rush. I dropped to the centre ring, moving to intercept its anticipated charge towards Paul, then the sick agony as I understood, too late. It was after *Lisa*.

It was a nightmare in slow motion. Lisa trying to run, stumbling. Falling. The Zarl caught her.

She stopped screaming. For ever.

The Zarl lifted its muzzle and grinned at me. I killed that Zarl with my bare hands.

Through the grief and horror I realised someone was singing. Singing the *Vesti* in a cracked horrible voice as the curtain came down. My voice. The grand finale.

The lights were on, blindingly. Paul was sobbing. The stage hands were carrying Lisa's body away. Someone was shaking me. It was Latham. His face was wet with tears.

"You've done it," he breathed. "Magnificent! What a trouper Lisa was. When the Zarl told me this afternoon

I couldn't believe it. What sacrifice!"

"The Zarl told you," I said. I could not understand. He kept talking and I did not understand.

"It was the missing touch, Lisa's death at the end, the final tragedy." Latham wiped tears from his eyes. "Sheer genius, Midge! Look at those Reaction Banks!"

The Reaction indicators flared a deep ruby, washing the stage in bloody light. Latham kept talking, huskily. "The council just called. We've got a smash hit. Within a week the hate bars will be condemned. The good fight is won, Midge! Meet Lisa II, fresh from the vats."

I looked at Lisa II. I understood.

"Oh God," Paul whispered.

Lisa II was lovely. She said, with a shy smile: "I do hope we have a good rehearsal tomorrow. I won't be as good as Lisa I, but I'll certainly try."

"Rehearsal," I said numbly.

Rehearsal for her death. Tomorrow night, the next night, all the nights, forever watching Lisa die.

The show must go on.

Everyone uses time every moment of every day. This article examines a point that is usually ignored

TIME PLEASE?

by

W. G. Speirs

FROM THE FIRST DAWNING of human consciousness, when a thing-no-longer-a-beast marked the positions of the shadow thrown by a stick in sunlight, to the present day ability to split a second into ten million parts, the measurement of time has intrigued and occupied man's ability to think rationally.

When we essay forth from the Earth to the unfriendly planets, new problems of measuring time will arise. For the strange conditions outside our planetary atmosphere will demand a new level of time-keeping, and clocks will have to work under the alien conditions of both free-fall and high gravities.

From the suburbanite scurrying for the 8.15 to the

scientist engrossed in measuring the millisecond reaction in his laboratory experiment, time dominates our daily life.

But just how much do we know about time?

Nowadays, physicists base their measurements of the phenomenon of time change on astronomical observations of the Earth's rotation. One second is defined as being exactly one 86,400th part of the mean solar day, the time of rotation of the Earth taking the Sun as a fixed point. As a definition, this is all very well; but in fact, and unfortunately for the physicist, the speed of rotation of the Earth—and so the length of day—varies by a small amount all the time. And occasionally it alters considerably—in 1897 it

speeded up by three-thousandths of a second a day, and then in 1914 slowed down by a similar amount.

So, basically, we must accept the fact that we have no absolute measure of time. We must define it in our own terms and base our instruments on those, just as the yard is the distance between two marks on a bar of metal kept at a constant temperature.

This view of time—the one which sees it as a broad flowing river—needs an instrument by which the river may be arbitrarily chopped into segments, each of exactly the same size as its neighbour. These machines, called clocks, are our practical method of measuring time, being secondary standards calibrated against the primary standard of the Earth's movements. They are essentially machines to imitate the spin of the Earth.

Nothing—for certain—is known about the way in which the clock was invented. There were gear-wheels in Ancient Greece and China; their use for machines to parcel out time is not so certain. It

was the need for devices to tell with a fair degree of accuracy the positions of the stars and planets that led to gear trains and the ancestor of clocks as we know them today. Astrolabes, for computing star positions, and companion planetary computers, were probably invented by the Greeks, made their way to Islam and thus to Europe some time during the 13th Century.

When their gearing was modified to produce the first clocks proper, it was natural that the dial should revolve and the pointer remain fixed. Only in the 14th Century A.D. did time-keeping become so accurate that mechanical machines were built solely to measure minutes and strike the hours. Previously, for the ordinary person, water clocks, hour-glasses and sundials had sufficed, with a slave or servant to strike the gong upon the hours. Then, for simplicity, the clock dials were kept rigid and the hands made to revolve.

The conception of a fixed and unalterable unit of time was perhaps one of the greatest

advances made by man. It is a fact that the ancients divided the day obstinately into twelve parts, beginning from the rising of the sun through to its setting. This meant that in summer the hour was considerably longer than in winter. This type of time measurement was still in use in Rome in 1850.

For the mariner, this type of time check was useless. He needed to know how long he had been sailing, and hours that were of different length were worse than useless. Through this very practical need came the conception of a unit of time. As the ancient mariners had to work out their own time scales, so will the astronauts of the future have to maintain an Earthly time system aboard their spaceships when the Earth is millions of miles behind them.

On Earth, we are lucky enough to have the constant gravity of our planet to keep pendulums swinging at a constant rate—although the force of gravity varies from place to place over the globe, so that pendulum clocks must be

adjusted to local conditions.

The invention of the mechanical escapement method of regulating clocks—the little wheel which spins backwards and forwards—was a brilliant achievement, making time-keeping independent of gravity. The first accurate time pieces using this escapement were used by the English navigators in the great period of brilliant British exploration of the Earth. Accurate time-keeping is essential in determining longitude and thus, in conjunction with latitude, finding the ship's position.

The navigators between the stars will need accurate clocks also, but probably for different reasons. Whereas they will be able to obtain a good positional fix from a triangulation of stars, they will not have the sun to tell them how many days have elapsed since the beginning of the journey. Astrogators will need clocks along with everyone else. The planets trace their orbits according to celestial mechanics but, whilst still bound by those laws, our spaceships will follow paths plotted by hu-

mans, dependent on human minds and the accuracy of human instruments. Accurate clocks, similar to the chronometers of ocean-going ships, will be carried to the planets and beyond.

For the spring-controlled type of clock is the simplest and most effective method of measuring time. It can be built to operate just as accurately under an acceleration of ten gravities as it will in free-fall or the test room of a factory. Under any conditions in which a human can exist, clocks will continue to run smoothly. Already, sealed wrist watches are used by airline pilots and underwater swimmers at widely varying pressures.

And they use only one 100,000th of a horsepower.

Temperature compensation is automatic, whilst non-magnetic alloys nullify the effect of enormous magnetic fields. Synthetic jewels keep the bearings turning smoothly, absorbing the 864,000 movements a day and able to show little wear after centuries of use.

The most accurate clocks on

Earth are the quartz clocks, accurate to one thousandth of a second per day. They derive their meticulous rhythm from the vibration of specially cut quartz crystals. Just as a bell has a certain note when struck, so these crystals vibrate at peculiar frequencies when excited electrically. Electronic circuits then amplify and record this vibration and, to obtain utmost accuracy, three separate quartz clocks are run as a unit and intercompared electronically. These clocks take up as much room as an oversized suitcase, most of this being the valve amplifier circuits to amplify and measure the vibrations. Except for their size and delicacy, which may be overcome, quartz clocks would be ideal for spaceships. Another drawback, which would lessen as technology progressed, would be the presence of another piece of equipment drawing electricity from a possibly limited source. The spring clock just needs winding.

Ordinary electric clocks will be virtually useless in space; they rely on the number of cycles in an alternating current

to maintain accuracy, sixty cycles a second in this country. And the cycles are stabilised by large control units at power stations, the stabilising itself depending on accurate clocks. If a space pilot prefers, he can buy an electrically driven watch. One such wrist watch manufactured today operates from dry-cells the size of beans—but accuracy must still come from the mechanical escapement in the train of gears.

Once a ship is in space, on course, there arises the problem of correcting the standard clocks. On Earth, this is done by radio signals from Greenwich. Millions of miles out the time-lag of signals from Greenwich, due to the finite speed of radio waves, 186,000 m.p.s., would amount to hours. A correction must then be applied. A radio signal sent from Earth to the spaceship somewhere past the outer planets is picked up, amplified, re-transmitted back to Earth. The time-lag may then be computed, and half this is the time lag correction that must be applied to the time signal.

Can we take our purely local concept of time out to the planets? Or will we have to adjust our lives and clocks to new days and hours?

The planets pose their own problems in time-keeping. Venus, eternally wreathed in clouds and with no Sun or stars visible, presents the problem of clock standardisation; but through the use of known techniques time could be kept with good accuracy. Daybreak will give only a gradual lightening of the sky, and at midday a slight increase of temperature to the daily maximum will be all to tell the Sun is overhead. It is not beyond the bounds of possibility that a thermal clock could be built.

But radio waves do pass unhindered through clouds. And the Sun is a radio-wave emitter. The snag to what appears to be a beautiful solution is that it is impossible to pin-point a radio-wave source with the same exactitude as a light source. However, it should be possible to plot measurements on a graph and determine the time when intensity of radio waves is

greatest and the Sun is overhead. This information would then be used to check against the accuracy of normal type clocks employed on the surface.

It may well be that Venus will use Earth time for lack of its own, and an artificial satellite orbiting outside the clouds would suffice for checking purposes.

Mercury always has one face towards the Sun, but with no atmosphere the planets and stars will be clearly visible and will enable accurate time measurements to be made.

The Martian year is 687 Earth days, and the Martian day runs to twenty-four hours thirty-nine minutes. Colonists on Mars will need a Martian calendar, and if they remain faithful to the twenty-four-hour day, need only slightly retard the rate of an ordinary Terrestrial clock. A clock that measures the time on both Mars and Earth has been built. With a gravity only two fifths of Earth, pendulum clocks would need much more massive weights to bring them

even approximately back to a normal time-keeping instrument.

Pluto is so far out, the last stop before the inter-stellar jump, that the Sun will appear only as a bright star. The inhabitants of Pluto (if there are any) would have to be brilliant to deduce the true orbit of Pluto around the Sun. Earthmen, with their clocks, will still have the Sun and stars to check the time and keep the thread with mother Earth open for their return.

For any long-term measurement of time, radio-active materials constitute a perfect time-clock. Half the atoms in a sealed tube of radium disintegrate over an exactly similar period as half the remainder, and so on. The amount remaining can easily be found by measuring the amount of radiation emitted. In spite of a fairly large experimental error, this method of measuring time is attractive because of its inherent simplicity. It would seem that, for extremely long periods, it is the ideal method.

**A man is the product of his environment. He is the result of what is done to him by others.
Is such a man responsible?**

THE WAY I AM

by

Dan Morgan

HALLO, WHOEVER YOU are. Don't try to answer. The receiving section of this radio is dead. I made it that way, because for me this is a time for talking, not listening.

I'm not at all sure why I'm sending this message, unless it's in the hope that somebody, somewhere, will hear it and understand. But if there's nobody there, then that's all right, too. It makes this thing just between me and God, and perhaps that's the way it should be. Grant is in the living quarters, probably asleep by now, so I'll tell the whole thing, the way it happened.

I was just wasting away my time there on the fourth satellite, and drinking more

than was good for me. Drinking was, after all, one of the least vicious forms of entertainment in that dockside slum of a planet. The other three satellites are run with the clean, impersonal efficiency one would expect of a government department, but Fourth is the property of the Interplanetary Development Corporation.

I.D.C. is a strictly profit-making organisation, prepared to sublet and offer unrestricted facilities to anybody who can pay his way. The government don't seem to take a great deal of notice what goes on there on Fourth. I have a theory that they are working on a very long term policy, hoping that by allowing all the carnivores and jackals of the human race to congregate

in that one beryllium steel and plastic jungle, they will have a greater chance to prey on each other and reduce their own numbers.

Anybody who can pay his way—but I had dropped out of that category a couple of weeks before, and the barman at the New London Grill knew it. He let me have a couple of glasses of the stuff that passes for scotch on Fourth, but when I asked for another he made it clear that I had overstayed both my welcome and my credit.

He was a mean-looking little weasel with a bald head, and eyes that moved too quick and too often. Two drinks were not enough to pull me up out of the hole of depression my last bender had dug for me. My reflexes were in such bad shape that when I reached out to grab his greasy white jacket, I missed.

He didn't intend to give me a second chance. The next minute, his hand appeared from underneath the counter holding something black and wicked looking. He swung at my head with it. My shoulders hunched in preparation for

the blow, my eyes closed. I knew I was going to be beaten, but my mind was so snarled up within itself that physically I was incapable of doing anything about it in such a short time.

The blow never arrived.

"All right, Fred. There's no need for that. I'll take care of this gentleman's account."

I opened my eyes. The speaker was a tall man with crinkly, blond hair and a dependable, open-featured face. His body was built on a heroic scale, big, but with the tautness of youth. He held the wrist of the barman in one of his large hands and unzipped his tunic pocket with the other, producing a thick roll of notes.

"There, that should take care of it." He peeled off a couple of twenties and flipped them onto the counter. "Now, get Captain Molson his drink, and I'll have the same."

He released the barman's arm and turned towards me. He had the sort of smile you don't often see from a grown man; all white teeth, blue eyes and unquestionably sincere.

"Lucky I happened along, captain."

I looked him up and down. He didn't belong there on Fourth. He looked too clean, inside and out, to exist in such surroundings; the kind of man you see on the government recruiting posters, with a half smile on his strong face and blue eyes focused on the horizons of man's empire. And he knew my name. Surely the Fedpol would never use so obvious a plant? And even so, what more did they want from me after the mental agony and deprivation I had already undergone?

"I'm Grant, Jack Grant." He offered a hand.

I ignored it, and asked: "What do you want with me?" People didn't walk around on Fourth doing favours for total strangers without good reason.

"To buy you a drink." He picked up the glasses Fred had just placed on the counter and handed one to me. "Here's to success." He drank, and I followed his example. I was in no state to be proud about the source of my drinks.

"And to offer you a job," he added.

I put my glass back on the counter with a bang and looked at him closer. "I'll drink your whisky, but I don't like your jokes." But he wasn't laughing at me. There was just that wide-open, friendly grin, as if his big body had grown, but there behind it, grinning out, was a young, uncomplicated boy full of faith in, and goodwill for, his fellow man.

I lowered my voice. "I'm a pilot, son. There's nothing else I can do, or want to do. You know my name—you must know the rest."

His face sobered, but it was still friendly. I know appearances can be lies, but I, for one, would stake a lot of credits on a face like that.

"Forget about all that," he said. "I know you are a good pilot, whatever the Board of Inquiry said. That's why I'm offering you this job."

I didn't thank him for the kind words. I was still in the dark, but as we went on drinking and talking I began to get my bearings. He had only been on Fourth a couple

of weeks. I gathered he'd done some co-pilot work on freighters from the other satellites, but that he had had some sort of a curious urge to come over and see what went on there on Fourth. I saw a little of myself as a youngster in him; he was still drinking in the whole great adventure, able to enjoy the horror and the pity of it all, and to laugh without it catching him in the belly.

Finally, he brought up the business of the job again, and I agreed to go along with him and see the owner of the ship. The man's name, when he mentioned it, made me even more curious to know how a nice kid like this had got mixed up with such people.

"Hallo, Molson. Nice to see you again. Take a seat." Bushman grinned up at me with his jolly, fat man's face. All but his dead, fish eyes. They were running over me like slimy tentacles, checking and appraising what they saw.

I sat on the edge of the chair, tensed up inside and needing a drink. I wanted that job, any job, badly. I hadn't worked in over a year—not

since the *Starfish* business. But even that was not good enough reason to make me want to speak civilly to Bushman. I've been around; you don't spend ten years of your life as a space pilot without rubbing your nose in the dirt sometimes, but beside Bushman I'm a white-haired boy.

"All right," I said. "You know me. I'm one of the best pilots in the business. Do I get the job, or don't I? If so, where to—and what in?"

"Relax, Molson." Bushman wiped his moist forehead with an immaculate white handkerchief. "You were one of the best pilots in the business. But you slipped."

The euphemism was not meant to spare my feelings, it was merely Bushman's cute way of showing that he had the upper hand. *Slipped*—eighty-five human lives, a ship wrecked beyond repair and myself over three months in hospital. The Board of Inquiry called it criminal negligence, and brought forth as witness one of the survivors, a button-eyed little electronics man, who swore that I had

been drinking at the time of the accident.

They said that the crash could have been avoided if I had listened to the Ground Control Operator. After all, it was easier to blame it all on one man than to admit that there were certain times, even aboard the most modern ships, when a bit of plain bad luck could wreck the whole thing.

I got off the chair. Placing both hands on the desk top, I looked into that false front of a face. "If I hadn't, I wouldn't be here. We both know that. I was told you had a job for a good pilot. I didn't come here because I crave your elephantine presence."

Bushman had lived up here on Fourth for so many years in the low gravity that his body was an obese, flowing thing that could never again support itself back on Earth.

"Mars, the round trip—in a Lindstrom." His face was tense now, watching me for reaction.

Most of the Lindstroms were out of commission now; they were old chemical fuel jobs, good enough in their time, but slow and clumsy now.

"I was brought up on them," I said. "How many passengers?"

"Not passengers—freight," Bushman said. "As much as she'll hold, and then maybe a pound or two extra for luck."

"Whose luck?" I asked. "Anyway, how long have you been contracting for the Colonial Authority?"

"Don't try to be funny." Bushman pointed a white sausage of a finger at me. "You'll go the long way round, using an elliptical orbit. Payload and fuel are important—time is not."

"It is, to me. What are you paying?" I was beginning to realise why he wanted me. Nuclear-powered ships made the trip in a hyperbolic orbit lasting three weeks; the elliptical trip meant over nine months each way. But it would yield an even bigger profit for Bushman on the cargo of luxury food and drink I guessed we would be carrying, goods to be peddled by Bushman's agent to the colonists who lived just above starvation level on C.A. rations.

"You'll be paid—more than

a has-been like you is worth," Bushman said.

I felt the colour drain from my face. Reaching forward I grabbed his loose flowing bow tie. "Shut your mouth, you fat louse," I gritted.

"Don't do that, Molson." There was something in the soft voice that made me let go of Bushman and turn to face the youngster. He was standing a few feet away from me. There was no hint of violence in his attitude; he was just grinning in a friendly manner that took me completely by surprise.

"Throw him out! I'll get somebody else," Bushman wheezed, behind me.

"No, Molson is the best man for the job, and the only one I am prepared to trust," Grant said. "If you don't take him, you'll be needing another co-pilot, too."

I looked from one to the other. Bushman, his fat lips writhing like slugs; Grant smiling like a college kid who has just been given a position in the first team.

"What's so special about running a Lindstrom?" I asked, suddenly curious.

"The crew," Grant said. "Bushman told you that every pound counts. I think he was underestimating—he's really worked it out to the last ounce." He was on my side all the way, I could see that. Just why, I couldn't understand, unless he felt that even as the wreck of a spaceman I was nearer to his own kind than the slobbering hulk behind the desk.

"What about the crew, Bushman?" I asked.

That was the jackpot question. The fat man paused for a moment, then waved a finger, taking in the two of us. "No crew—just you and him."

He really was cutting the corners! But it was possible for two men to handle the ship if they knew their stuff, and they could take the isolation.

"You're really willing to take that kind of chance?" I said to Grant, thinking of the things that had been plastered over every screen in the system about me, after the Inquiry.

The youngster placed a hand on my arm. "Don't worry, Molson, we'll get along.

He's offering two thousand credits apiece. A trip like this needs a man of your ability and experience. I've never handled a Lindstrom. What do you say we take his money?" He grinned. Perhaps he *was* big enough, mentally and morally, to keep things running smoothly for the full nine months. Without him I could not have landed even this kind of job, and two thousand credits would give me a good stake, enough to try a bit of angling in the right quarters with a view to getting my ticket back.

"All right, Bushman. We'll take it," I said.

The folds of flesh round his mouth moved again in the grimace that was meant to be a smile. "So kind of you, Molson. Now, will you be so good as to get your stinking hide out of my presence. Grant knows the details, and where the ship is. You blast off tomorrow morning. Sober," he added.

Two thousands credits or not, I would have dearly loved to sink my fingers into that fat neck, but Grant took me gently by the arm and steered

me out of the room. He seemed to be a useful person to have around, able to keep even me out of trouble.

"Right, I'll see you in the morning," I said, as we walked into the main corridor. There was a parched dryness at the back of my throat, and drinking is a private business with me when I feel that way.

He still had hold of my arm. "Are you sure you'll be all right? Is there anything you need?"

"I'll manage." I tugged myself free. "What time and where do I see you?"

"Nine hundred hours at Lock Fourteen. She's loaded and all ready to go." I could see that he was reluctant to lose sight of me, worried that I might go on another bender. I'd earned myself something of a reputation during the past year.

He was more than right. There was some sort of elation at getting the job, coupled with disgust at myself for taking it, that demanded the old liquid solution. I woke up the next morning lying flat on the

floor of my room, where I must have collapsed straight after opening the door. My head felt like the inside of a mixing machine, and I was already two hours late.

I stuck my head under the shower for a minute, there was no time for anything else, and left. Somehow or other I managed to make Lock Fourteen without folding up again.

Bushman and Grant were sitting in a small cafe near the Lock. Gravity out here near the edge of the big wheel was higher than that towards the centre where Bushman's office and living quarters were. I could see that the fat man was uncomfortable. He sat there, mopping ineffectually at the sweat that oozed on his pale forehead.

"You no-good, drunken clown," he panted. "Do you think I've got nothing to do but sit around here?"

I was feeling like several shades of hell myself, and certainly not in the mood for taking that kind of thing. "All right, you over-stuffed balloon—consider the arrangement off." I turned to walk out of the place again.

"No! Don't go, Molson." Grant was on his feet beside me, the smile still as sincere and bright as it had been the previous day. "What difference does a couple of hours make in eighteen months?"

He delayed me just long enough for my brain to simmer down and look at the situation in a more or less sensible manner. My credit on Fourth was running out; if I didn't earn some money soon I would be deported back to Earth, and from there I would stand no chance of getting any kind of a space job.

I stood there, biting back the retorts that sprang too readily to my lips, as Grant argued with Bushman. The fat man was all for dropping me and looking for another pilot, but Grant repeated his threat of the previous day to quit.

Finally, Grant got his way. He and I headed for the Lock proper and, donning suits, took a jet taxi scooter out to the waiting ship.

It gave me a little thrill in the pit of my stomach to be boarding a ship again. I knew that if it had not been

for Grant's intervention I might never have made it, even on a tub like the Lindstrom.

We had to enter by the emergency lock, next to the control cabin. The reason why was obvious as soon as the inner door opened. Every inch of space was occupied, piled high from floor to ceiling with crates and boxes of stuff. The only parts of the ship that were free were the control room, and a small cabin at its rear which contained two couches.

Grant ruffled a hand through his boyishly tousled hair. "Here we are. Bushman's round the system tours—spend eighteen months in the lap of luxury. One thing, we shan't starve, by the looks of that lot out there."

I looked out into the corridor again. Bushman, having broken all extant regulations in the matter of crew, had apparently decided that there was not much point in making even a pretence at complying with any other safety requirements. Should anything go wrong in the engine room—a thing that was more than possible in a

ship of this age—it would take us hours, perhaps even days, to move the cargo sufficiently to get back there and do something about it. True, the engines would only be in use for a few hours during the entire journey, but there was always the chance.

"Well, captain, shall we blast off?" asked Grant. We had both removed our suits by now and were back in the control room.

I nodded. Grant gave me an encouraging grin and settled himself in the astrogator's seat. I lowered myself into the pilot's position and looked at the instrument panel in front of me. It was the first time in over a year.

I felt strange, removed, and then the flood of memory streamed into my mind, the lights, the screams and the grinding impact—the horrible sense of tragic responsibility.

"Ready to blast off, sir!" Grant's voice, firm and clear, broke in on my recall.

I dismissed the memories from my mind with an effort and started to raise my hand towards the firing keys. It lifted a few inches, then

slumped back onto the couch like a dead thing. Looking down at the hand, I tried to move it again. It felt entirely numb, as if all the nerve fibres connecting it with my sensory reception centres had been severed. No amount of willing it to move obtained the slightest flutter of response. The rest of my body trembled with the tension of the effort.

This was it, the legacy of the crackup, the box of horror which I had not opened until this moment. For a whole year I had not piloted a ship, because I had been prevented from doing so by the Board of Inquiry's ruling. Hysteric laughter trembled on the edge of my lips. They had stopped me, when all the time I no longer had the necessary ability. The traumatic experience of the wreck had burned so far and so deep into my associative paths that down there, below the level of consciousness, I was a hopeless cripple who might never be capable of piloting a ship.

I stood up. I could do that. I had perfect control of my limbs and mind, just so long as I did not try to do the

only job I wanted to do, the one to which I had devoted my life.

Grant must have seen that there was something very wrong. He walked over.

"I've got to get out of here," I said. "You'll have to tell Bushman. I couldn't pilot this ship to Mars if he gave me a million credits—I'm finished."

He placed a large hand on my shoulder. The grin did not come so readily this time. "Nonsense. You've got to take hold of yourself, Molson. If you give up now, you're finished. I'm not going to let you throw this chance away."

I wanted to believe him. All through the year of inactivity the only thing that had kept me sane was the thought that some day soon I would be in control of another ship. It was the only way of life I knew. But I did not talk about it. I sat down again, this time in the astro-gator's place.

Grant took over the pilot's chair and a few seconds later I felt the firm pressure of

acceleration on the small of my back. We were on our way.

The engines were soon off again and we floated, unpowered, in the direction where we would pick up the orbit of Mars in nine months' time. There was nothing to do; the ship needed no controlling until then. We just sat and talked, or rather Grant talked most of the time.

He wanted so much to help me. It became an obsession with him to tear down the barrier and break my conviction that I was finished as a pilot.

"Before this journey is through you'll be as good a pilot as you ever were, and you'll have me to thank for it," he would say, as if he expected the very repetition of words to have a hetero suggestive effect on me.

But I knew he was wrong. All the stuff he kept on pouring out, all the rationalisation, was just so much noise. It didn't touch the root of the thing. I *knew* the reason why I was this way, but that didn't make it any easier to convince myself.

After the first few weeks I began to try to avoid him. Under the circumstances that took some doing. I found a crate in the cargo, which made life a bit more bearable. I would lie there for hours, dulling the pain in my mind with the fiery stuff. But Grant would always turn up sooner or later and start talking in his friendly, persuasive manner.

He did not mention the liquor, but I knew from the way he looked at me that he did not approve. He just went on talking, trying to be helpful and to save my soul—when all the time I knew that I was eternally damned.

We were almost three months out when he said: "I don't suppose you feel like a bit of exercise, Molson? The rear view camera is acting up. Somebody will have to go outside and take a look at it."

He wasn't ordering me to do anything, just talking in his usual, amiable way, but suddenly I felt that I couldn't do anything else but offer to tackle it.

It was just a routine job, replacing the lens of the

camera which had been smashed by a piece of cosmic debris, but I made it last as long as I could. It was good to be doing something useful again. I looked out at the stars and the great blacknesses between, and a great sadness came over me as I wondered if I would ever see them like this again after the voyage was finished. What good was a pilot who could not handle a ship? When I got back to Fourth I might as well take the first ferry down to Earth as waste more of my time there.

The job finished, I glanced at my oxygen dial. I must have been out there longer than I had thought; there was only enough to last another five minutes at the most. I picked up my tools and headed for the airlock.

After taking one last look round, I bent down to open the outer door of the lock. The wheel would not move. I tried again, tugging with all my strength, but the result was the same. It was jammed.

I was in no mental state to handle such a crisis. Instead of switching on the helmet

radio and calling to Grant to come and release the door from inside, I just kept on trying to wrench it open, using up valuable oxygen and energy.

Despite the suit refrigeration, I was sweating and the air was becoming gradually fouler. Soon my mind began to drift in the drunkenness of anoxia, a complete delirium in which my co-ordinated efforts to open the door ceased and I lay down on the hull babbling helplessly.

The last thing I remembered before I lost consciousness was that the door seemed to open of its own accord. But at that stage I was unable to distinguish dream from reality.

When I opened my eyes I felt as if I had been on a bender lasting a week. The opening of the airlock had not been a dream after all. I was lying on the pilot's seat in the control room. It had been adjusted, leaning backwards, to make me more comfortable.

Grant held out a bottle. "For medicinal purposes," he said, with a grin. He watched

as I gulped at it eagerly. "Close call, Molson. If I hadn't begun to get worried about you and come out to see what was going on, you'd have been finished."

I sat there, not saying anything, just looking at that pleasant, well-meaning face. I was thinking of all the things I owed him: my job, the chance of a new start when we arrived back at the satellite . . . and now, my life. Finally, he must have realised that I was in no state to conduct a conversation. "If you're sure there's nothing else you want, I'm going to get a bit of rest," he said, getting to his feet.

"No. You go ahead," I said.

That was half an hour ago. Since then I've been sitting here figuring the whole thing out, making up my mind what I've got to do, what I'm going to do.

I've had a tough life. Even as a kid it wasn't easy. There was my old man; he was something like God to me, maybe even more important—certainly more immediate. His

rage and contempt could really hurt, and when he wasn't there people would talk about him and threaten me with his wrath. And all the time they took great pains to point out that I would never turn out to be as good a man as he was—that was the part that was always ground into me.

When he died I decided that I would make myself a big enough man to take his place. It wasn't a matter of personal ambition; the only satisfaction I expected to get out of it was the pleasure of showing my contempt for them, the voices, the belittlers.

That was the way it was going to be, me against the universe. The odds did not frighten me. I had my self-respect, and that is the most valuable weapon a man can have. A weapon and a goad to action that motivates his whole ambition.

They could not seem to understand that at the Board of Inquiry. According to their idea I should have handed the ship over to the Ground Operator as soon as he asked

me. It didn't seem logical to them that I should want to retain control of my own ship in the emergency, even though by doing so I increased the chances of an accident.

They said I had what they called a sociogenic disability—a psychotic block that prevented me from co-operating with other people.

That's a hell of a can to tie onto a pilot, especially when my record up to that time was perfectly clean. But that's just the way I am. I don't want any favours from anybody—is there anything wrong with being like that? A man's got to stand on his own two feet, and if he can't he's no business to be around at all.

This Grant—what right has he got to be so goddamned helpful?

I never did anything to or for him, but he walked in on my life, smiling and doing good as if he was some preacher. If it hadn't been for him, I wouldn't be on this trip at all. He gave me the chance to find out that I'm no longer any use as

a pilot. All along the line he's been in there helping me.

Fine, that's the way he is. Those things I can ignore.

But the one thing I can never ignore, *or forgive*, is the way he saved my life. All the rest of my conscious moments I shall be aware that I am alive only through his favour, through his grace. Just because he came out there and dragged me in.

Unless I settle the debt I shall never be free of the thought of how much I owe him. And I can't live that way.

I'm going into the living quarters in a minute. I've got a wrench here, and he'll be asleep. It's a messy, brutal way of doing the job, but there aren't any weapons aboard. He'll die quickly. I can't afford to take a chance on struggling with him; that massive young body is too strong.

I'm finished now. Maybe you'll understand the way I feel. If not, it doesn't really matter. I don't need your sympathy.

I don't want anything from anybody—that's the way I am.

The author of this article comes up with a surprisingly simple answer to a problem which will soon have to be solved

Design for a Space Suit

by COLIN MAY

WHEN MEN VENTURE into space they are going to be faced with the necessity of taking their environment with them. Basically, this environment can be reduced to the prime factors of air, water, food and protection. Unless a spaceship or space station can provide these factors, then men will not be able to survive. But space stations have to be built, spaceships may need attention and, of course, there is always exploration. Space suits, then, are essential.

A space suit is simply a device which will enable a man to live and work in the void. Fundamentally, the problem isn't new. Deep-sea divers have met and faced it, high-altitude climbers and

pilots the same. Individual protection to maintain life in a hostile environment is common. It would only be reasonable to assume that an existing device, such as a diving dress, could be adapted to enable a man to live in space. Reasonable, but wrong.

Space is somewhat unique in that, as we've never been there, we can only guess at what will be needed. It is because of this guesswork, and the fact that anyone's theory was as good as anyone else's, that many wrong notions and false concepts have grown and circulated about the probable form a space suit will take. The favourite of most artists and authors seems to be a loose-fitting suit made of some tough, flexible material and equipped with

a large, transparent fishbowl helmet. Nice, until we remember that in space, where there is no ozone layer to offer protection from ultra-violet, such a helmet would quickly result in something far more drastic than sunburn. So, transparent fishbowl helmets are out. And so are loosely-fitting flexible suits.

Take an ordinary balloon, one of the long, sausage variety, inflate it hard, tie the end and try to bend it. Not so easy, is it? Now imagine a man enclosed in a loose, flexible suit inflated to a pressure of 15 lbs. a square inch, the normal sea-level pressure. The suit would be nicely rounded, the arms and legs extended rigidly from the body, something in the shape of a starfish. To bend an arm or leg would require impossible strength, as the internal pressure would be in the region of a ton to the square foot. Deep-sea divers, when they balloon up to the surface by reason of a stuck exhaust valve, have to be helped from their suits. Working in such a position or such a suit would be impossible.

Starfishing, then, is the one thing which automatically eliminates all loosely-fitting flexible suits. Rigid, jointed suits, like old-fashioned suits of armour, are no better. Internal pressure is the same no matter what the material and, if we want to enclose our spaceman in a nice, normal layer of air, then we had better keep him inside the ship. He will be more useful that way.

The usual reason given for the necessity of a pressurised suit is that a man will explode if exposed to the vacuum. A pressurised suit is necessary right enough, but not for the reason given. A man will not explode if thrust into the void without protection. Such exposure means a sudden drop from 15 lbs. a square inch pressure to zero. Now, it doesn't really matter if the pressure drop is from 30 lbs. to 15 lbs. or from 45 lbs. to 30 lbs. If the body can stand one, it can stand the other, and the human body can stand far higher pressure drops than that.

Divers prove this each time they come to the surface, and

I don't mean deep-sea divers, I mean ordinary swimmers. Anyone who has dived to a depth of fifteen feet has experienced a gain and loss of fifteen thousand pounds pressure. Doubling this depth—and is quite common with native divers and those using aqualungequipment—exposes the body to even greater pressure changes. And by the same token we can get rid of the notion that bends will be a grave danger in space. Bends are caused by bubbles of absorbed nitrogen forming in the blood at the sudden release of pressure. But the United States Manual for Divers shows that bends are not to be feared from rapid ascent from depths up to around 40 feet, a pressure change greater than the sudden loss of 15 lbs. a square inch.

What would happen to a man thrust into the void is that, unless he expelled his breath, his lungs would be damaged. Lungs cannot stand more than an abrupt change of 8 lbs. without harm, which is why all divers are taught to expel their breath, not hold it, when ascending to the surface.

He would lose consciousness very quickly, in about 15 seconds, as proved by tests of personnel suddenly exposed to extremely low pressures, and his blood would begin to boil.

It is this boiling of the blood which makes a pressurised suit essential. The lower the pressure the lower the boiling point, and at zero pressure blood would literally boil.

So we have an anomaly. We need pressure but could operate better without it. Accepting the fact that we must have it, how little can we get away with?

The atmosphere consists mainly of oxygen and nitrogen, with oxygen, the gas we need, at about twenty per cent. Pure oxygen then, at a pressure of 3 lbs. a square inch, will provide a man with all the life-giving gas he needs. A man requires approximately one ounce of oxygen an hour or, if we want to be really generous and allow for extra exertion and losses, say 3 lbs. for twenty-four hours. This quantity of gas, if compressed, can be contained in

a steel cylinder weighing 22 lbs. So a man could carry a generous supply of oxygen for twenty-four hours without undue inconvenience.

But tests have shown that healthy men, breathing ninety per cent. pure oxygen at normal pressure for periods of more than seven hours, have come down with a form of pneumonia. Whether this same lung-irritation will continue when breathing pure oxygen at lower pressures is not known. But it seems reasonable to assume that oxygen, in its pure state, is not to be breathed for long periods.

Still, we're only carrying 25 lbs. of oxygen and cylinder, and could afford to carry another of nitrogen to dilute the oxygen by fifty per cent. But that puts the pressure up to 6 lbs. if we are to get the same amount of oxygen. And 6 lbs. of internal pressure still gives us over 800 lbs. pressure on each foot of suit. Not so good.

Fortunately, there is a way out. Pressure is pressure and it needn't be air pressure. There is no real need to have a

layer of air over the entire body and, if we want mobility, we can't have it. The same effect can be obtained by using the fabric of the suit itself to supply the needed pressure around the limbs and body. The head does not matter; the helmet can be rigid and filled with air. What is needed is an elastic suit which will constrict around the limbs and torso. We have our pressure and we have our mobility. The problem is solved—almost.

It would be solved if we could ignore the fact that a man, like any other organism, cannot live in his own waste. As space suits will be worn for more or less short periods, we can confine our worries to disposing of exhaled carbon dioxide and heat. Disposing of the carbon dioxide is easy. If we want to conserve our air and use it in a closed cycle we can make use of sodium peroxide to absorb the unwanted gas. But as we can easily carry more oxygen than we really need, a better way would be merely to expel the used air into space. Heat, the second waste product of the

human body, is quite another problem.

A man generates 150 watts of heat and, normally, he gets rid of it by convection, conduction and radiation. In space he won't be able to do that. A space suit must do more than provide pressure and air; it must provide protection from external forces, the sun and space itself. Of the two, the sun is the thing to worry about. Unshielded by the atmosphere, solar radiation is strong enough to raise the day-side temperature of the Moon to that of boiling water. A man, working in a space suit on say a space station, is going to receive the sunlight directly on his suit and that suit is going to get hot. True, if he were in shadow, say that of the Earth or on the night-side of the Moon, he would radiate that heat away, but unfortunately for him, he carries his own heat engine with him, himself.

To protect the wearer against direct sunlight, the suit must be of non-conductive material—remember he is wearing it close to his skin.

But you can't have a material conductive one way and not the other. If the suit keeps heat out, then it must also keep heat in, and heat will be the one thing the spaceman wants to get rid of.

A compromise can be reached by having the suit material conductive enough so that some heat from the wearer can be radiated away and silvered so as to reflect most of the heat received from outside. The trouble with that is that a bright surface radiates less than a dark one. A dark one, on the other hand, absorbs more radiation. The silvered suit is the lesser of two evils; we are trying to keep our spaceman cool, not roast him alive.

A healthy man can withstand a great deal of heat because he has his own built-in cooling system. He gets hot, he perspires, air evaporates the perspiration and thus cools him down. It is on record that a man has actually stood in a baker's oven and watched roasting meat without harm, and in the equatorial regions high

temperatures are stood for long periods. But this built-in cooling system depends on a constant supply of air to carry the heat away by convection. A man wearing a skin-tight space suit will not be able to cool himself naturally. He will get hot, he will perspire, and he will suffer and eventually die of heat prostration.

Unless something is done about it.

Something can be done and should prove to be quite practical. A hot man perspires, so for comfort, if nothing else, that perspiration must be taken care of. It can be dried out of the air together with the water vapour from the breath, by chemicals in use today for dehydrating stored goods and manufactured articles. This same chemical is used to prevent moisture condensing in "moth-balled" battleships. But we want to keep the space suits simple and avoid various packages of chemicals, all of which get in the way and need attention. The answer, obviously, must lie in the design of the suit itself.

The solution is surprisingly simple. The spaceman, in order to breathe, must carry cylinders of compressed gases and in that he also carries his own air-conditioning equipment. Gas under pressure will cool rapidly when released, the only problem is to arrange some device whereby that physical property can be taken to advantage. It can be, merely by using the gas to flush out the suit.

But a skin-tight suit is difficult to flush and difficult to put on. To be really effective, it would have to be tailor-made to each individual and help would be required both to put on and take off the suit. Also, there is the possibility that space suits may have to be donned in a hurry and, remember, we have only about fifteen seconds to get equipped in case of a split hull, holed cabin or other emergency. Flexible suits, which are loose-fitting enough for rapid donning, are useless. The wearers may live, but they would be helpless to do other than wait for death.

A man exposed to the void

needs two things immediately, pressure and oxygen. Pressure so that his blood will not boil, oxygen so that he can remain conscious. Oxygen can be provided by a face mask similar to those in use today in high-altitude aircraft. Pressure must be available at all times.

It can be provided by a tight, form-hugging undergarment, made of some elastic absorbent material. Such material is available today and is similar to that used in elastic stockings and bandages. It must be absorbent because it must soak up perspiration; elastic to provide needed pressure on the limbs and torso. It could, if necessary, be worn for long periods without discomfort.

For the spaceman venturing into space with his space suit, such an inner garment will be essential, both from the view of preventing chafing and to allow for air-conditioning of his suit. The outer fabric, silvered and ribbed to offer the largest area possible to radiation, will also be of an elastic consistency, enough so that it will constrict about

limbs and torso. The neck will be fitted with a simple device to lock the helmet, perhaps a screw-locking union as used on diving dress, which is simple and foolproof.

Oxygen and nitrogen will be carried on the back out of the way, the valves on the chest to allow of easy adjustment. The helmet will be opaque but for a wide, round window in the front. To cut down glare, this window could be of twin sheets of polarised glass so that a turn of the outer pane would cut down the light transmitted into the helmet.

From the gas cylinders twin air lines will run down to the boots. These boots will have extremely thick soles to provide insulation against contact with inanimate materials in space. Such materials, as the night-side of the moon with its extremely low temperature, radiate their heat away very fast when shielded from the direct light of the sun. They, unlike a man, do not generate their own heat.

Air from the tanks of compressed gases will be fed into the suit from the feet.

It need not be a steady flow, but a series of pulses, forcing its way between the outer and inner fabric, driven by the pressure of its own expansion. The gases, as they travel towards the helmet, will absorb the body heat of the spaceman and arrive safely warmed for breathing. Used, they will be ejected into space, carrying the unwanted carbon dioxide, water vapour and heat with them. Alternatively, air could be fed directly into the helmet, but with a second feed system running to the feet, so that, whenever he felt too warm, the spaceman could cool himself by releasing a blast of air which would flush his suit from feet to helmet, drying and cooling him at the same time. The elastic material of the outer fabric would, of course, return to close contact as soon as the flow of air ceased.

Simple, safe and eminently practical for, as we have seen, plenty of air can be carried with little inconvenience. With air and protection taken care of, all that is

left is water and food. Water will be provided in plastic bottles fitted with a sucking tube and must be regarded as an essential. So, also, must salt to replace that lost in perspiration. It is doubtful whether a spaceman will be in his suit long enough to feel hunger, but, if he is, glucose will provide quick energy. Both glucose and salt tablets could be fitted in spring-loaded, mouth-operated dispenser tubes.

The only remaining problem is how to make suits to fit an assortment of different sized individuals. A tall man, obviously, will not be able to wear a suit designed for a short man and vice versa, but aside from a few stock sizes, they will not have to be individually tailored. The suits can be fitted with zippers backed by soft rubber pleats so that they can be donned easily and quickly and then zipped and fastened snugly to the body. This arrangement will allow of some degree of adjustment, and the elastic nature of the suit-material will take care of the rest.

REWARD FOR VALOUR

by MARK CLIFTON

To a man taught high ideals compromise isn't easy. Sometimes such a man grows tired of compromise and steps on his own road to personal integrity

THE NOSE OF THE shuttle is still pointed upward away from Mars. Around us there are only the black and empty reaches of space. We are headed out towards the stars—in a leaky old shuttle hardly able to lift against the light gravity. There will come a point when the nose will falter, level, turn downward. The gravity will win. We will streak Marsward—faster—and faster—

Sam looked me over in the manner of country folk, pointedly unimpressed, and without hurrying he came from around the counter.

To further show how unimpressed he was, he stopped at a pile of cured hams beside the candy counter, where peppermint sticks and round lemon drops were displayed through the glass.

I walked over to him and pulled my government pass from my inside pocket. He looked at it, without touching it, and looked at me again. Indifferently, he walked over to the open doorway and

"I'll need a ticket for the shuttle back to Marsport," I said to the old fellow who ran the Trading Post. Old

spat a stream of dark tobacco juice out into the bare yard.

The nearby patches of lichen on the ground shot out tendrils to bury roots into the moisture before it evaporated in the thin, dry air. He walked back again, still in no hurry, behind the counter, and down to a partition. He went through a door in the partition, and stood behind a wicker window marked: *Slag Hills Transit System*.

"Can I help you, stranger?" he said through the window, as though he hadn't seen me before.

"Yes," I answered. "I said I want a government pass ticket back to Marsport."

"You mean you want a free pass without paying for it?" He peered at me through watery yellow eyes, and ran his fingers through his rusty, grey hair.

"You'll get your money," I answered, a little shortly. "The government redeems the tickets. You must know that. I'm not the first inspector who's ever been through here."

"Sure I know it," he answered. "I know I got to wait

weeks, maybe months for the money. Meantime, you get the service today. Like everything else about the government," he was grumbling half to himself now. "A man is expected to jump when the government snaps its fingers, but he can wait for his own rights."

He handed me a ticket which looked as if someone had worn it in his shoe as a bunion pad. Under the dirt it said: "Free Pass—Government" on it. Even the printing seemed contemptuous.

"When is the next shuttle due?" I questioned. It seemed a normal thing to ask, but old Sam took exception to it.

"Appears you want a lot of service on a free pass," he commented. "Always the way. Them that has to pay, takes what they gets and puts up with it. Them that gets it for nothing are mighty particular."

"There's nothing particular about wanting to know when I can get out of here," I began hotly. Then I checked myself. "Careful boy," I said to myself. "Government men are unpopular enough as it is,

without you adding to the injuries."

"I mean," I amended, "I'm going to catch hell from the government if I don't get back to Marsport on time."

"Thought you was the government," he said, and looked up at me closely again.

"I just work for it," I answered. "It doesn't treat me any better than it does you." And that isn't the half of it, brother. You'll never know.

"Fancy that," he commented seriously. "Well, the boys up at the mine told me you wasn't as nasty as most inspectors. Reckon maybe so. Too bad you work for the government, son. You could be mighty nigh human in spite of being Earthborn."

"I didn't ask for the job," I said. "I was drafted into it. People on the Earth don't like the government any better than you do. They'd never get enough employees if they didn't draft them."

"You mean there's still decent people left on Earth? Been so long since I visited

there, I kind of got into the habit of thinking everybody on Earth was a government man living off us colonists."

He dropped the conversation, when I didn't comment, and went to the back of the ticket office cage. He ran a long and dirty finger nail down a stained schedule, and then came back to the window where I waited.

"Next shuttle's due today," he said. "We ain't had one for nigh a week. Yep, ought to be due today—or tomorrow—or the next day for sure. This is the end of the line, and if nobody's coming out here, sometimes they don't come all the way. Depends who's on it. One of the ordinary shuttle bums, and you can expect it when you see it coming. If MacNab's on it, you can expect it when it's due—maybe today."

As simply and easily as that, my fate was introduced. MacNab, the cause of my death—and the restoration of my life. You brought us up all wrong, grandfather. You taught us that honour and truth were im-

portant. You taught us to search for them, and never stop searching. Had you any realisation, grandfather, how old-fashioned you were? How rare they are? How lonely a man can be who cannot settle for less? Perhaps you did, for it is a tremendous thing to have found them—and of all places, in an old shuttle bum.

"What's so exceptional about MacNab?" I asked.

"As a trusted employee of the Slag Hills Transit System, I ain't in the habit of gossiping about my fellow workers," he reproached me. "Anyhow, I'm closing up the ticket office until further notice."

He pulled a mesh wire grate over the window and fastened it from within. He came out of the back door of the cubby hole and around to a counter where coveralls and respirators were piled on a table.

"I heard you ask the ticket agent about MacNab," he said, without so much as a twitch of a smile.

I did a short double take. I couldn't tell whether the old bird was Mars happy, or

kidding me. I played it straight.

"I hear he's pretty dependable," I said.

"You ain't been around much, have you son?" he asked. "But then, I reckon you wasn't even born when MacNab was the top space pilot in the whole solar system."

"Funny," I commented, seriously. "If he was so great, you'd think I'd have read about him somewhere—studied about him in school or something."

"He didn't get the breaks," the old trader commented. "Why, I remember the time he spent two years flying a two-man ship out to Saturn and back. The navigator guy with him went space crazy—one of them sly kinds of crazy—and MacNab didn't realise it until they was smack dab in the middle of Saturn's rings. For twelve days, without any relief and a crazy man on his hands, MacNab nursed that ship through the debris until he could slow down enough to turn and get out of it. Hand operated. There wasn't no

automatic meteor shields in them days."

"Whew!" I said. "That was quite a feat."

"Bravest, most stupendous thing a man ever done, as anybody knows who knows the Saturn rings," he agreed.

"But I've never seen any mention of it."

"Yeah," Sam said drily. "You never seen any mention of it. With a crippled ship and a crazy loon for a partner, he made it back to Earth. Two years of continuous, super-human strain. He got a one-paragraph mention on page thirty-four."

"But why?" I asked in bewilderment.

"Happened about that time, the World President's young wife got caught in a scandal—a dilly of a scandal." Sam chuckled gleefully at the memory. "Most of the newspapers were opposition owned, and the scandal didn't get hushed up. MacNab landed on the day the news broke. As I said, he made a line mention on page thirty-four."

He walked over to the

doorway and let another stream of tobacco juice fly.

"Been neglecting them plants over in the upper right hand corner of the yard," he commented in explanation. "Wind usually is against me. For as little air as we got here on Mars, it sure does move around an uncommon lot."

I waited.

"About MacNab," he resumed. "Another time he stood off a whole tribe on Callisto single-handed. Wound up making the chief sign a trade treaty with Earth. Opened up the whole daggoned moon to trade, it did. Diamonds big as your fist there. That alone was enough to make a man famous for life."

I knew of the Callisto diamonds. I could agree.

"Only that time there was a pickle manufacturer's son cut his finger. With a toy knife or something. The pickle baron saw his chance to get some fancy advertising. He spent a couple million on that boy's cut finger. A couple of million, put down in the right places, to the boys who

decide what to print and how to feature it, gets a lot of attention, son.

"The entire Earth lived from hour to hour, waiting for the doctors' report on how the cut was coming along. Would there be an infection? Would his whole arm drop off?" Sam snorted with disgust. "A joint session of World Congress was held to discuss whether the bandages ought to be changed or not. You'll always find the politicians where you find the publicity, son. The manufacturer opened up thirty-seven new pickle factories and still couldn't keep up with the demand. He made a billion."

Could the old man be pulling my leg? Somehow I doubted it. There was the ring of sincerity, of honest indignation. And, too, I well knew that the measure of heroism is determined by the open news space, or somebody thinking it's time to get the people hopped up over something.

I didn't need the old trader's punch line, but he gave it anyway.

"MacNab landed on the day the bandage was to be changed. He done better though. He made page twenty-nine, this time, and two paragraphs. Some of the jeweller trade-papers featured the story about the diamonds, but they didn't think to mention MacNab." He sighed.

"It went on that way," he said. "MacNab probably did more to open up the solar system than any other man, living or dead. But nobody ever heard of him. He always came in on the wrong beat of somebody else's publicity. Even in the companies he worked for, it went the same. The company wheels always just happened to be looking in another direction. You play poker, son?"

"A little," I answered, although I couldn't see the connection.

"You ever have a streak, no matter how good your hand, somebody at the table can always nose you out?"

"Sure," I laughed. "If I have two pair, he's got three of a kind. If I've got threes, he's got a straight. If I've got a straight——"

"That's MacNab, son. And the wonder of it is, it never soured him. At least, not to notice. He ought to be one of the Mr. Bigs, instead of a back hills shuttle bum. But he keeps right on, just the same. I wonder about such a man. If maybe he don't get real hungry for space, and doing big things. If inside he don't grieve about things. I wonder about MacNab, son. I wonder a lot."

He fell silent, staring at a shelf of canned concentrates. I walked over to the doorway, and stared off across the bleak and monotonous landscape.

"Trouble with MacNab," the old man resumed to my back, "he don't talk about himself. If he'd been a blow-hard and a bragger, maybe sometime when news was dull, they'd have picked him up and made a hero of him."

"Could be," I answered.

"But he don't talk. He's been on this run for over two years, and I'll bet he ain't never said fifty words to me. But then, none of us old timers like to talk. I reckon you noticed that."

I grinned out into the landscape, and didn't contradict him. I spat out into the yard at a particularly dry looking lichen. I felt a little sorry for it, and thought I could spare that much moisture. It leapt upon the spittle as a starving cur upon a juicy bone. I almost felt it waggle its leaves at me.

The old geezik came up behind me and looked at the plant.

"That one has been in the dog house for being too greedy," he commented. "But I reckon it's had enough punishment." He looked at me closely. "It likes tobacco juice better," he said reproachfully. "Long as you was giving it moisture, looks like you might of flavoured it a little."

"By the way," I asked. "Do you carry stamps?"

He changed character on me again.

"I was just about to open up the post office," he answered. He went over to the other side of the store and opened a window by sliding back a panel.

"Did I overhear you telling

the store clerk you wanted to buy some stamps?" he asked out the window.

"Yes," I answered. "And, postal clerk, how does it feel to be a government man?"

"Why you—you——" he blurted angrily. Then he began to chuckle. "You got me there, son, fair and square. First time I ever realised I was a government man. Maybe they're not all Earth lice after all."

"Depends on which window you're looking out of, doesn't it?" I grinned back at him.

The air is getting foul and thin in here. I can hear a faint, high whine, almost beyond hearing range, where the air is escaping through a tiny hole into space. There is a good chance our bodies may never be found. If we crash near lichen, the moisture of our bodies will cause us to be consumed within minutes. I realise I am writing this to fill in the time, rather than to leave a record. Somehow I seem to have been filling in the time all these years, waiting for life to begin, for something real and

vital to happen. Now I fill in the time waiting for death.

When spaceliner life rafts fail to pass inspection for deep space, they are sent to such places as Marsport and sold into suburban commuter service. They serve the poorer sections, of course. And if the ship has a little air leak, a spotty firing mechanism, a burnt rocket chamber, there is probably only discomfort to the passengers. There seldom is real disaster.

And when there is, the surviving families can always write a protest to the government. They sometimes receive an answer, too—form Xa758693—telling them there is a committee studying the problem. This letter has served satisfactorily for the last twenty years or more. There may even be such a committee—political favourites have to be hired somewhere.

When the ships become even more defective and maintenance begins to eat up the profits, they are shifted farther back into the smaller towns and feeder lines. Finally, they

wind up as spur shuttle service from the mines and trading posts to the trunk lines.

The same route is followed by the space pilots, and often simultaneously. With wry amusement, and some pity, one can fasten the classic recommendation upon most of these old boys. They are good men—when sober.

In times past, I often wondered what these old boys thought about—the boys who had explored the vastness of space by the seat of their britches—and now piloted ore shuttles. I wondered what MacNab thought about, what hells and tortures he went through as he saw himself dropping from ace pilot down a notch, another notch, and still another. I wondered if he had a sense of failure, of somehow missing the goal of high and noble purpose—a grief to match my own.

There was no question but that his had been a life of valour, unrecognised perhaps, but nonetheless very real. In a less spectacular sense, had mine?

Grandfather, the rewards for honour and integrity, for striving always toward nobility of the spirit, not ever counting the cost if right be involved—those rewards have not come to me.

I could have liked MacNab when I met him back there in the trading post. But there was something about him aloof from like or dislike. Others might have classed him as nothing more than an old shuttle bum, but I felt the glamorous aura still about him of the old space pilot—the real space pilot and not the glorified truck drivers of today.

Nowadays, a pilot presses a button at the beginning of the journey and another button at the end. Automatics handle all the rest. But in MacNab's day, pilots searched the black reaches of space as endlessly and anxiously as the ancient mariners searched the sea. Space crept into their eyes, and back of their eyes, and never left their eyes again. And when one looked into those eyes, one somehow looked into the depths of space.

Is this to be my reward, grandfather? To be able to recognise valour when I see it, without being told by a publicity man that it was there?

I was the only passenger scheduled. MacNab punched the button to close the doors of the shuttle after I had thrown my luggage aboard.

He had the barest words for me, and those given grudgingly. He was tall and slender, with grey hair still thatched thick upon his head, and coming out of his ears and nostrils. Scotsmen do seem to run to hair growth as they get older. His uniform was surprisingly neat and meticulously patched. There was no sign of the Venus weed twitch, the Moon dust squint, the Martian chemo vein burst, the Earth alcohol eye glaze.

But my job was not to wonder about people. My job was to interpret and enforce government regulations. I sat down in the nearest seat and took out a sheaf of new regulations. I tried to make sense out of the gobbledegook

in which the regulations were written.

I pulled an analysis sheet out of my brief case to parse the sentences of the regulations. Maybe if I could separate the clauses from the phrases, I could begin to grasp the idea. Hell—I couldn't even find a subject or a predicate. The boys who wrote these regulations should go far.

I found myself wondering if the mine I had just inspected really would destroy the explosives I had condemned. I wondered if the company would consider the cost of the condemned explosives to be of greater value than the lives of the men it employed and use them anyway.

I found myself wondering why MacNab didn't start the ship. He seemed to be pawing at levers and jabbing at buttons. Why didn't he take off?

I went back to the regulations. The first sentence had thirty-two phrases in it. I got as far as determining that phrase seventeen modified the meaning of phrase three, and

in combination with phrase twenty-five it nullified three entirely.

Well, there was the expected loophole, the invitation for graft. I knew what I was supposed to do. For a price I was to point out the loophole to the companies I inspected. Then a later inspector would come around and impose a stiff fine upon the company for non-compliance with the regulation. The fine would be split among the attorneys, judges, inspectors, and others involved in the deal.

The companies like it that way. Although they may have to pay a fine of a few thousand, they get the chance in the meantime to bilk the public out of a million. The officials on up the line seem to like it, because the inspectors who co-operate always get the choice assignments.

Everybody seems to like it, except me. I have to be contrary. I have to be honourable. I get the stinking back hills assignments because of it, where there isn't much money to be had anyway.

You didn't do right by us

kids, grandfather. You should have let us grow up with an attitude to fit our own times, instead of giving us a set of standards out of a world which is dead and almost forgotten.

I looked up again from my attempts to understand the regulations. MacNab was out of his seat and had the floorboards of the pilot cabin up. His head was buried down among the activators. The seat of his britches showed the neat stitches of a large patch. I saw one smeared hand come up and lay down a wrench. It fumbled around for a screwdriver. It picked up the screwdriver and returned into the hole.

I looked out of the quartz window, expecting to see the bleak landscape. But something of interest had arrived. A private space yacht was landing near the trader post. Across its side was emblazoned the word, *Press*. That word would get it through where even high officials would be stopped. Everyone knew the tremendous power of the Press. A vindictive reporter

wielded more power than a king.

Idly, I watched the ship settle to the ground. I saw the doors open, and two men come out. One of them was burdened down with photographic equipment. The other bore the arrogant stamp of the reporter who had to answer to no one except his editor. His slightest whim could make or break an individual, or a company. Back in the twentieth century they had begun the semantic loading of news releases with personal policy and prejudice. Now the straight reporting of facts was entirely forgotten.

They went into the trading post. I went back to the gobbledegook. Whatever he was here for, the reporter could not hurt me. I was already the lowest scum, too small to interest him at all.

The next time I looked up, MacNab was sitting in the pilot seat again, trying out the buttons and levers with patient resignation.

"Won't it start?" I called out to him. All right, it was a stupid question, and I knew

it, but I felt I should show some interest.

MacNab didn't feel called upon to answer. From the sudden set of his neck and back, I could see he was forcing himself not to answer. I suspected he was past all words. Apparently, he regained a measure of control.

"You might as well go back to the trading post," he said slowly. "I'll call you when the ship is ready to move."

It was no more comfortable in the trading post than in the shuttle, but perhaps my presence bothered MacNab. I left my luggage where it was, along with my brief case. MacNab let me out the door and I walked around the Press yacht and back to the store.

The photographer was lounging indolently near a stack of canned peaches. The reporter had old Sam back in a corner, talking to him.

"But there's got to be something around here worth a feature story." There was a spoiled petulance in his voice. "The boss said get a feature

story about a back hills mine. Don't ask me why, but by damn if there isn't a story here, I'll make one."

He stuck out a square chin in a bellicose pose of a fighter who hadn't yet learned the feel of an opponent's fist. His whole face was a shallow mask of unfeeling arrogance. There was no sensitivity around his eyes or mouth. To him, beauty would be an exercise in semantics, deliberately false, measured in column inches.

Old Sam was responding with truculence and stupidity.

"I don't know anything to tell about," he was mumbling contrarily. "We just mine Dural ore and that's all there is to it."

"But my damn," the reporter shouted, as if trying to get through the wall of stupidity by volume of voice. "Aren't there even any colourful characters? What the hell do men come to work here for? Something must drive them here. A sane man wouldn't come out of choice. Hell, give me a man—any man—and I'll *make* a story

out of him. I gotta have something!"

"What about MacNab?" I heard myself asking. I could have kicked myself, because I had intended to stay out of it.

The reporter whirled around.

"Who are you?" he asked belligerently. "Who asked you to stick your nose in?"

"He's a government inspector," Sam replied. Then, defensively: "And a decent one."

"Oh." The reporter grunted the word contemptuously. His lip curled and he stared insolently at me. I was more polite. I kept my lip straight when I looked back at him.

"Who's MacNab?" he asked, after his look had put me in my place.

"MacNab is the man who conquered Callisto single handed, and opened up the trade in diamonds," I answered hotly. Then I rushed on: "MacNab is the man—the only man in history—who nursed a ship on manual control through the rings of Saturn—back in the days

when there weren't any meteor shields."

I heard a step behind me, but I thought it was the photographer.

"Is that something important?" the reporter asked insultingly.

"Important——" I felt my anger beginning to get out of control. But I was interrupted by a quiet voice behind me.

"No," the voice said quietly. "It wasn't important."

I whirled around and saw MacNab standing behind me. His flesh was pale, and the planes of his face were frozen into a slender mask. Even the reporter was abashed by the quiet dignity.

"What I mean, is——" the reporter faltered. "Well, if it really was important—but then, you see it happened so long ago—well, you certainly couldn't call it news—but——"

"It wasn't important," MacNab repeated with finality. Then he turned to me.

"I've got the ship firing," he said. "We can leave now."

I started to turn and follow

him out, when there was a low rumble, then a roar—the devastating roar of the world coming to an end. The frame building of the store shivered and trembled as if a gigantic hand was shoving it around.

"The mine!" old Sam gasped in a shrill, bleating voice.

"Those explosives!" I yelled an answer.

All of us were running for the door. The photographer was blocking it with his equipment. I was able to feel a faintly malicious taste of glee as I pushed him, hard, to one side and plunged through. MacNab was directly behind me, running fast.

We rounded the corner of the building, and saw the open shaft of the mine entrance in the hill back of the store. Smoke and dust were pouring out of it, and I saw the figure of a man stumbling through.

"Faster," I gasped. "Oh, those fools. That condemned explosive!"

The reporter had caught up with me now, and MacNab was drawing ahead. Far be-

hind, the photographer and old Sam were running as best they could; the one handicapped by equipment, the other by age. MacNab didn't seem to know his age. He was drawing further ahead of us—running lithe and straight as a lad.

"What about the explosive?" the reporter gasped as we ran up the rocky slope toward the mine entrance.

"I condemned it," I gasped back between breaths. "Damned owners—must have tried—to use it up—all at once—before I could turn—in my report."

We were close enough now to hear the faint, hopeless screams of men down in the darkness of the mine. MacNab, running strong, shot into the black entrance before the reporter and I had even reached the level at its mouth.

There was another roar of explosives letting go.

We faltered. I remembered MacNab was in the mine. The rest of the miners might be unreal figures, statistics to be read about in the newspapers, but MacNab was something

else again—a human being. One of the few I'd ever met.

"Come on," I shouted to the reporter, who was hanging back.

I rushed into the entrance of the shaft and heard him coming behind me.

It was as if I rushed into a crashing, roaring blackness. I knew nothing more.

There is an unreality about partial unconsciousness. One hears sounds, and dimly sees hazy sights, but they have no connection with one another and fit into no pattern, until later, when one reasons them out. Seconds stretch into eternity, and eternity collapses into seconds.

I was dimly conscious of rushing feet. I remembered seeing MacNab pass by me, again and again—going toward the light with a man across his shoulder, going back into the blackness for another, gasping and sobbing for breath—but going.

I remembered lying there, unable to move, to pull myself together, mentally cursing myself for not helping,

for being a waste. So typical of me.

I became conscious of a raving, a shouting near my head—the bellowing bawl of a brat who has stubbed his toe and thinks he's killed. The cobwebs cleared a little more and I realised it was the reporter. That strange sense of time we have made me realise that ten, maybe fifteen minutes had passed.

I turned myself over and sank, exhausted and prone, to the rubble floor of the mine. I rested another minute. The bellowing bawl became louder and my mind cleared more. I pushed myself up to my knees and hands, my head hanging down. The weight of the world was on it, but I lifted it far enough to look over at the voice. The reporter was caught under a timber. There was another timber, partly supporting it. Even then, I knew the reporter wasn't badly hurt.

The timbers must have shaken loose after the last explosion, knocking me out with a glancing blow, and pinning him beneath them.

I tried to stand up, and after an age I found I could make it. My knees were shaking, ready to crumble, and I was sick with a terrible nauseating sickness, but I made it. I staggered over to the timber and began to tug at it. The reporter was shrieking at me.

"Lift it, you fool! Don't drag it! Lift it!"

"It's too heavy," I gasped. "Next time I tug on it, slide out from under it."

I tugged upward. He slid. The weight was too great. I had to let it down again. He screamed.

"You're crushing me!" But I could see the bottom timber still held up most of the weight.

I tugged upward again. He slid again. This time he slid all the way. I dropped the timber and went down on top of it. I felt myself blacking out again. Faintly, I heard the reporter cursing.

"Damned senseless fool. You tore my pants!"

I was glad I couldn't hear anything more.

The next time I came to, I

was outside the mine shaft, and old Sam was bending over me, squeezing a moisture bulb into my mouth. All about us were groaning men, bleeding, suffering—some staggering about, some lying supine—some courageous, some afraid. The lichen plants had been cleared away to keep them from shooting tendrils into the open wounds. The fat-butted mine owner was crouched over to one side, his back up against a rock, and with one hand squeezed tightly around the stump of an arm.

I felt an unworthy rush of gladness. It is so seldom the instigators of such actions get caught up in their own greed. It's usually poor devils who can't help themselves.

The reporter was standing at my feet.

"Holy damn," he was saying over and over. "What a story! Holy damn! I wanted a story and I got it." He laughed loudly. "I'll have to compliment you stinking Martians. You're damned obliging!" He looked around the scene of suffering men triumphantly.

None looked in his direction.

I pushed Sam away and sat up.

"Doctors?" I questioned.

"On their way," Sam answered. "I sent a radio call from the mine office. Due any minute now."

I looked over at the mine owner and felt a little regret. Somehow, I wished he could be made to suffer more, to know all the suffering he had caused. But it probably couldn't be helped. He'd be rescued, too, when the doctors came. It was a pity.

I felt unworthy for my regret, because there were a dozen men writhing in agony, while I wasn't really hurt. There were three men lying very still. They would never know pain again. I felt another rush of anger in my head.

"I don't condemn explosives for the fun of showing my badge!" I shouted senselessly at the mine owner. He did not look in my direction.

"Damn!" I shouted. "Damn all greedy humans anyway. I'm sick to death of humans."

I'm goddamned ashamed I was born a human!"

Old Sam started rubbing my head between his hands, palms over my temples, massaging evenly.

I shook my head and came out of it.

"What's the use?" I groaned. "Oh, what's the use?"

The reporter was still standing at my feet, looking at me. His face was alive with a scheming delight.

"You saved my life, fellow!" he shouted at me.

"Nuts!" I answered disgustedly.

"You saved my life!" he shouted again. "Boy, I can see the headlines now. Headlines I'm responsible for. You're gonna be a hero, fellow."

I spat upon the ground, and then, irrelevantly, thought I should have saved it for Sam's pet lichen.

"Yes, sir," the reporter was still raving. "What better material for a hero? A cheap chiselling little government stooge! I'll show you what

I can do, what a big man I am. I'll take a little snotnose such as you, and make a world hero out of you. The publicity won't hurt me any, either."

"Look," I said wearily. "There's the hero." I pointed toward MacNab, who had got to his feet and was watching us. "If you've got to have a hero, pick on him. He deserves it. While I was lying there unconscious, and you were yelling your head off, he went into the mine and got the men out."

"That sonofabitch!" the reporter shouted, suddenly raving mad. "I'll break him. I'll hound him out of every job he gets for the rest of his life. Let me lay there and suffer, will he? While he pays more attention to the scummy miners than he does to me—ME! Kick loose, will he, when I grab at his feet, trying to get him to help me!"

I struggled to my feet. I staggered over to MacNab.

"Let's get out of here," I said. "Do you feel like driving the shuttle? Can you make it?

I need to get to Marsport. Mines can blow up and the world come to an end, but the government wants its pretty reports made out on time." I was using it as an excuse. Suddenly I couldn't stay around the reporter any longer.

"Don't you want to be a hero?" MacNab asked, with a speculative look in his eyes.

"Hell!" I exclaimed in disgust. I looked at the reporter and my lip curled at him. I had forgotten to be polite.

He caught the sneer, it even penetrated his thick hide. He started to make a rush at me, to carry his bravado to its limit. He thought better of it. I was standing, ready to find out if that jutting jaw was glass.

"Why, you cheap little stooge," he shouted. "I'll fix you, too. Hero, huh? Why I'll show you up as the blackest little tinhorn chiseller that ever took a bribe!"

"Let's go," MacNab said to me in a tone of respect.

We started walking through the rubble toward the beat-up old shuttle.

I suppose, grandfather, that each of us, at one time or another, would like to feel he has done something significant—that the world recognises a thing we have done—a special thing—a thing of valour. I suppose we consider recognition as the reward for valour. But now it has been brought home to me how cheap recognition can be—how often it serves only some ego-maniac's desire to build himself through reflected glory. This is no reward for valour, grandfather. I would not have such a reward.

MacNab opened the door of the ship, and we went inside. My head was splitting with pain, and I sank down into my seat with thankfulness.

Without a word, MacNab went up into the driver's seat and touched the starter button. The shuttle took off in a roar.

We began to climb. We climbed farther. It was not necessary to climb so high. Eons before, the mountain ranges on Mars had been worn down to rolling hills.

Wearily, I turned my eyes from the scene below, and

looked in puzzlement toward MacNab. He was pawing at the levers, jerking them to and fro. They moved readily, too readily. They moved as if they were free to move, unencumbered by any pull upon them. The ship continued to climb.

MacNab looked back at me. His face was pale, but there was no fear in it.

"The controls snapped," he said quietly. "I reported how worn they were, dozens of times, to the Company. They ignored my reports. Now they've snapped. I can't control the ship."

"There's nothing to do?" I asked.

"Nothing," he answered. "Nothing at all."

"I'm glad," I said, and was puzzled to hear myself saying it.

He looked at me strangely.

"I'm sorry," I said. "I didn't mean that. Or rather, I guess I meant it for myself, without thinking about you."

"Then you can say it for both of us," he answered. He turned away and looked through the window in the

nose of the ship. He was silent for a while, a few minutes. It was as if he felt the certainty of nothing to do, and did not pretend by futile motions to be doing anything. He knew the mechanism of the ship, what could be done in flight, and what could be done only on the ground.

It was a life raft, built to get passengers from a space liner to a landing place in emergency. No more suitable for continuous and commercial use than the olden rubber life rafts upon the sea of Earth. Except for greed and graft, it would not have been put into commercial use at all. And this time the men responsible would not be caught in their trap; they could still sit behind their desks and shake their heads and hypocritically say it was too bad, pilot must have been drinking.

"Up here," MacNab called back to me, "you can see the stars. Come up and sit in the co-pilot's seat. See the stars!" There was a singing ecstasy in his voice.

I left my seat and went up front.

"Just for the record," I said, "not that I really care, but what about safety devices, escape hatches, things like that?"

"Are you kidding?" he asked. "On an ore shuttle?"

"I'm surprised the inspectors let it operate," I commented.

"Are you?" He looked at me and smiled.

I said no more.

Yes, there were the stars beginning to show through the thin air of Mars.

MacNab was rapt again. He was in his beloved space, out among his glittering stars, the understandable stars which operated according to patterns of logic. The friendly stars—because they were not human. His eyes took on a glow to match the stars.

A strange impulse came over me. Have I a measure of ego, after all? Some futile urge to construct a monument to myself? An unworthy, human weakness, such as that?

At any rate, I took out my notebook and pencil from my pocket. I began to write. I write the new shorthand, very

rapidly. It has taken me but a few minutes to jot down these concepts—all that has happened.

No, I think I am not writing to build a monument, after all. I think perhaps it is a summing up, a habit of analysing, born of years of analysing government regulations. I cannot let this end of life be government gobbledegook, with no sense in it. I must find out what it means.

The air is growing thinner. I know our moments are few. MacNab is leaning forward now, almost straining, as if he were trying to help the shuttle climb higher, higher into his beloved space before it falters, turns, and begins its straight downward plunge.

MacNab belongs to space and it is right that he should die in space.

And I? I belong nowhere. It does not matter where I die.

As with everyone else, I have often speculated on what I might do if I knew I must die immediately. Could I face the moment with courage?

I find it takes no courage. I find a sense of relief—almost release. I need no longer be an outcast—an honourable man in a world which knows no honour. Death reduces us all to the same level.

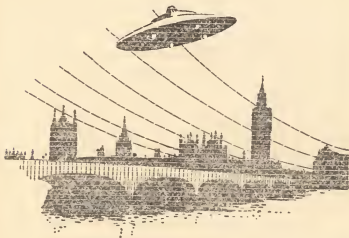
I find myself smiling at those human beliefs which would carry the superiority of some even beyond the grave. How self-righteous we all are—how human.

Instead, I know a sense of welcome, a tremendous seren-

ity. I find I have less dread than I knew each morning when I awoke, knowing I must deal with the world another day. I shrink less from the clean, bright points of the stars than I did from the actions of my fellow men.

This, then, is the true reward—not recognition, not shouts of acclaim, but the ability to face what must be with serenity.

This is the reward for valour.



A lie can always be justified if it is for the common good. But what if the lie is not a lie?

CAT UP A TREE

by ROBERT PRESSLIE

HE WENT THROUGH THE routine of entering his cell automatically. He checked the door gauge to make sure the pressures in the corridor and the cell were reasonably equal. With the door closed behind him, he heard Janie humming in the dinerette and casually twisted the oxygen demander for double rations. At the same time, his eye took in the temperature and humidity readings and noted that all was well.

The entire process of entering his particular section of the Beehive took about ten seconds. Do a thing a thousand times—take the same precautions several times a day over the course of a year—and you do it without conscious thought. It's like remembering to put your pants on before going out. Pure routine.

Greeting your wife can get like that, too. A casual hello and a lukewarm peck where

a soft whisper and a breathless embrace used to be. Routine.

But it wasn't that way with Drew and Janie Banner. Married on Earth, with the honeymoon and every minute after that on Mars, they had yet to let themselves slip into matrimonial routine. Drew was through the main room in three strides. Janie met him in the archway of the dinerette. And they clinched.

With the dark nimbus of her hair tickling his nose, Drew asked: "What's for eats? Chicken? I smell chicken fried in butter, with chopped parsley and tarragon——"

"Mmm," she murmured "Or chicken a l'Espagne, with green pepper and mushrooms, and cubes of celery."

Drew tipped her head into his chest to get a clear, unclouded look at the table. The places were set, the self-heating cans were beside the plates, ready for puncturing. He squeezed Janie tighter when

he saw how she had tried to temper the severe utility of the table with a mock rockery of dyed lichen, sand, stones, and a broken mirror for a make-believe pond.

"Ah well," he sighed. "Let's see what they've issued today."

"Yes, boss." Janie adjusted the isotherm plungers on the cans. Drew went to the window.

The window was a wall. It was one whole side of the dinerette. Clear, thick and unbreakable, it was their little arc of the great dome that housed the colony. It was the only thing that separated the comparative comfort and safety of their cell in the Beehive from the inhospitality of the planet outside.

"It's going to be a fine day tomorrow." Drew judged the night and gave his verdict.

"No rain?" asked Janie.

"No rain," he affirmed.

"You pick certs to bet on, don't you, Drew? Is that the best the great meteorologist can do?"

"Stick to your pots and pans, wench. Let the master meditate."

As he trailed his gaze over

the near-black sky and located the familiar constellations, he let his mind relax. The day's work was done. He was home with Janie who was humming happily somewhere behind him. He had a rest day tomorrow—which really would be a fine day according to the readings. He would stay in the cell with Janie, he told himself. That would make up for all the lonely hours she had to spend without him.

He shortened the focus of his eyes to watch her reflection in the concavity of the plastic wall. And, immediately, the soft smile quirking his lips froze. The image of Janie, slightly larger than life, was a picture of a crazy-eyed fiend, creeping up on him with a pair of scissors aimed between his shoulder blades. It was only then that he noticed she had stopped humming.

Ferguson took it calmly. He let Drew tell his story without interruption, and when Drew had finished, there was a long silence before Ferguson spoke.

"You're an exceptional man, Banner," he said. "So

I'll do an exceptional and unconventional thing. I'll let you into one of the colony's directorial secrets; this has happened before."

"Before! Who?"

"No names. Sometimes, as with you, the wife has attacked the husband. Sometimes it has been the other way around. And sometimes there have been attacks at random. People have tried to kill each other suddenly, without premeditation."

Ferguson's expression was a mirror to his memories. "You were exceptional because you came and told me. The others didn't. In some cases it was too late, of course. One person was a corpse and the other a deranged invalid. From discovered evidence, it appears that quite often the intended victims were able to prevent their own murders, as you did. But instead of coming to me for help, they tried to handle the problem on their own, and eventually the end was the same. Death. Nobody can be vigilant all the time."

Drew listened politely but impatiently. "What about

Janie? What can we do about her?"

"In the other cases," said Ferguson, "the corpses were quietly buried and the killers were shipped home for psychiatric treatment. The whole affair was covered under the heading of Transfer."

The papers on Ferguson's desk were as neat as a pack of cards, but he squared them thoughtfully with his palms. "Janie will go into dock," he said. "She'll be kept under survey and helped back to health by the medical staff—don't worry, only the chief M.O. will know what she did. And, meantime—meantime, we're going to lick the problem of why a rising percentage of the colonists are going berserk."

Drew had difficulty getting everything orientated. His main concern was for Janie. He wanted to know if she was curable, how long it would be before he could have her back, and what he could do to help.

"You can help, sure enough," Ferguson said, confidently. "I wouldn't have told you so much if I hadn't

thought so. The problem is a new one to you, Banner, but I've had it for months. From clues that the head-shrinkers have picked up from the people we sent home, we—I mean myself and the section directors—we think we know what the problem is and how to solve it."

"Where do I come in?"

"You'll be the trigger. We've got our weapons for the solution ready. You'll be the trigger. Tomorrow, the meteorological section director will be off work with a mild stomach ache. You'll take over his job of announcing the district forecasts. One of them will contain a warning of sandstorm over Area——"

"But there won't be any sandstorm tomorrow!"

Ferguson looked at Drew and dared him to drop his eyes. He slid the top paper from the pile on his desk towards Drew. "That's the weather outlook for tomorrow. Send it out exactly as it is, except for the sixth item. Change that to sandstorm and amend the atmospheric pressure and temperature figures to suit."

Without Janie, the cell was empty and lifeless. In fact, for Drew, the whole colony lost some of its sparkle and he spent more and more of his waking hours immersed in his work. Since frequent visits to the hospital quarters were discouraged, he saw little of Janie. Each time he did see her, he was more certain that she was fit to return to normal life. Hypnotic treatment had erased from her mind all memory of what she had done. She was led to believe that she was convalescing from an obscure fever.

Drew wanted the chief M.O. to use hypnosis again and thus wipe out any future killing instincts. He got a long, involved lecture about how such a course would cut Janie's personality in half and leave her little better than an amiable, acquiescent idiot. Wait, he was told:

Six weeks after the start of Janie's internment, he was met at the end of the hospital corridor by the chief M.O.

"She's going home today," the doctor said.

Drew made the wrong inference. "To Earth?"

"To your cell," the M.O. corrected. "She's waiting in there, all dressed up. From now on it's up to you. You're the one who has to be careful. Always remember that it was fever she had. Never betray any hint of what she did; that might restore the memory. Try to act as if the past six weeks had never been."

Drew nodded eagerly and made for the ward door. The doctor caught his arm. "After she's settled down go along and see Ferguson. He wants a word with you."

"How is she?" asked Ferguson.

"Fine, thanks."

"Good. Take a look at this."

Ferguson unrolled a wide sheet of paper. There was a single black line drawn across it. It could have been an outline of a local mountain—except that Mars didn't have any. The colony director ran a finger up the western face of the mountain.

"This graph shows the slow but steady increase in the number of acts of violence over the past year." His finger

touched the peak. "That point marks the first day you came to see me."

Drew looked further along the paper. The black line dipped with a swoop. It didn't make a precipitous drop, but the rate of descent was at least twice the rate of ascent.

"They're falling off," he said.

"Exactly," said Ferguson. "That's why I decided it was safe to let your wife out of dock. These—these accidents still happen, mind you, but not nearly so frequently. However, I want this graph to hit zero. That's why I sent for you."

Drew didn't see what he could do, but he said, politely: "I'll do anything that will help."

"Then stop working so hard. Take a holiday."

"I like my work!"

"We all do. That's an essential passport to Mars. The best way you can help me and the colony is to take a long rest. You see, Banner, it's you I'm worried about now. I've been watching you. You've been working every

minute you weren't at the hospital. And I think that, of all the people in the colony, you're the one most likely to be the next killer!"

"Me! I hardly have time to speak to anybody, let alone think of murdering them. And if you believe I'm a potential killer, it's hardly fair to Janie to release her into my custody."

"The timing of her release," said Ferguson, "was deliberate. Apart from the falling murder rate and my opinion that the conditions fostering the attacks are changing—apart from the point that it is safe for others to release your wife, I decided she must be with you now. She is part of your therapy. Use your holiday to take her out. Go to the recreation rooms. It's a long time since you went there. Visit some of the other colonists; consult the rota sheets and find out who else is on relief. Most important of all—meet people."

Ferguson dismissed Drew with an injunction to call again after his week of rest.

Janie was delighted that he had been granted leave. After

initial disquiet on pondering the reason for the holiday, Drew's spirits soon rose to her bubbling level and the week began to fly by.

He was that sort of character; adversity and misfortune never touched him deeply. He was single-minded in his devotion to Janie and his work. Nothing that went on in the world around him diverted him for long. Which made him the good scientist he was—and also the butt of his few friends who forever derided him for not being au fait with the latest news or the current gossip.

He made up for a lot of his omissions now that he had the time. With Janie, he played games in the daytime and in the evenings caught up with a batch of movies or went to parties in the cells of their acquaintances.

Wherever he went, one topic inevitably cropped up—the Martians. In his typical way, Drew listened to most of the gossip but heard little of it. It was Janie who made him realise finally that there was something substantial in the rumours flying everywhere.

"What do you think they were like?" she asked one night.

"Which?"

"The Martians. They say the femur they found was a yard long."

Drew recollected as much as possible of the miscellaneous items he had been hearing. "Must have been big," he contributed, not very sagely. "Did I hear somebody say they had tested the bone?"

"And it turned out to be only a million years old!"

"Only?"

"A million years is nothing, Drew. A hundred million would almost certainly have meant the Martians were extinct. But that bone is so recent there's a good chance that there might be a few still eking out an existence somewhere on the planet."

Drew couldn't keep up with Janie's empirical way of thinking. He bent his matter-of-fact mind to the subject. "The bone signifies nothing," he said. "It does seem to indicate that there may have been Martians at some time, but it may be a bone from the very last one to die."

Janie opened her mouth to interrupt, but Drew forged ahead. "Furthermore, if there are any still around, why must you assume that they have to *eke* out an existence? Women always jump to——"

Janie sneaked into the conversation again, tapping out her points on her fingers. "One, there are Martians—and living ones. Two, if there were a lot of them more evidence would have been found. Three, since there aren't a lot of them, they must be eking, etcetera."

"Phooey!"

With the index finger of her right hand still poised on the third finger of the left, Janie grinned triumphantly. She tapped her fourth finger. "And four," she said. "Four—you didn't hear this tit-bit, Mrs. Henley told me this evening—they've seen a Martian!"

"I don't believe it."

"Ask her yourself. Or ask Ferguson. He told Pam Henley. Her husband was one of the men who saw the Martian, and since he's still working down at the equator, Ferguson thought he should tell Pam what her husband

had found. You know how Ferguson is with his morale-lifting messages to the little woman whose spouse is far from home."

Drew laughed at her accurate insight into one of the colony director's little devices. "When did this happen?" he asked.

"Today. I must be one of the first to know. Don't you think it's wonderful?"

"If it's true," he admitted.

The sighting of the Martian appeared to be just that. Next day, the colony buzzed with the news. The day after that, the men who had seen the creature flew in from the equator and put an end to all the speculations about the nature of the Martian.

It was bigger than a man, they said, and wider. It was deeper in the chest and longer in the arm. They had been about fifty yards away when it scuttled from one mound to another. From that distance its features were not clearly discernible. But from its size, there was no doubt that the fossil femur was a bone from a creature similar to the one sighted.

Janie picked on one minor piece of information to clinch her argument with Drew. "It was naked," she said. "That proves they must be eking!"

Ferguson sent word cancelling his previous instructions and postponing his meeting with Drew for a week.

In that week, Drew felt better than he had at any time since joining the colony. He was back at work. And while his work had lost none of its appeal to him, he saw it in a new perspective. He saw it as something which occupied a certain part of his life and a certain part of his time—but no more. When his stint was finished, he was able to lay his work aside, forget it completely, and enjoy a full social life.

He didn't notice any change in himself and he wasn't sufficiently introspective to wonder why the colony seemed a better place than he had thought before. He just noticed that life was good and people were nice.

The first thing Ferguson did when the meeting came off was to slide the mortality

graph across his desk. The line that had been added since Drew last saw the graph swooped vertically to the base. If it had gone any further it would have registered resurrection.

"Not one in ten days," said Ferguson. "Thanks to your wife."

"Janie?"

"That's right. And to you for coming to see me in the first place. Results show that our evaluation of the problem was correct. But until your wife was examined in the local hospital we couldn't be sure."

"You told me the others had been analysed, back home."

"Ah—that's where we slipped up. On Earth, the conditions which drove these people to murder no longer prevailed. The analysts failed to extract one tenth of the information which we got from your wife in one session here on Mars."

Drew admitted his confusion. "I don't get it. Conditions in the colony are good."

"Agreed. But a tree full of

fish doesn't make a cat any less scared."

Ferguson laughed at himself. "I'm sorry about that. I had an analogy in mind and I've taken it too far." He sobered. "Out here on Mars, man is like a cat up a tree. He got there in a mad rush of enthusiasm. Then he found himself stuck there, lonely and afraid, and scared to come down."

It wasn't the analogy that bothered Drew, but the inference to be drawn from it.

"We've been in space a long time now," he said. "High altitude rockets. The building of the Wheel. The Moon landing, and the station built on the Moon. The first few ships out here. The building of the Beehive. And now the colonisation. Until lately there was no running amok." "The first pilots were different. They had the enthusiasm. They were rushing up the tree. The Wheel and the Moon are different, too; the old homestead is still there within sight. Even out here the initial enthusiasm left no room for fear to creep in. Fear didn't come until the

colony began to run smoothly and there were the beginnings of comfort."

Ferguson walked round his desk. "As soon as the colonists began to have leisure," he continued, "they began to notice their loneliness."

"There are five hundred of them," Drew said enquiringly. "True. Yet how little the colony is among all the millions of square miles of Mars. You were always the nose-to-the-grindstone type and it affected you less than the others. They didn't have your temperament. They felt insecure, afraid, insignificant life in a desert of death."

"How do you know?"

"From Janie. It was as deep inside her as in the rest. It had to be dredged up. And it clinched the guess we had made from earlier analyses. There was a subconscious suspicion in every colonist that Mars was unsafe. It was bare of inhabitants of its own, therefore it was never designed to support life. I'm sure you can follow the reasoning."

Drew nodded. "To a point, yes. But Janie, she's always

been the pioneering type. At least, I've always thought so."

"That's no guarantee of immunity from fear. And if you introduce fear into any closed community of animals, human or otherwise, they always begin to tear at each other's throats. In the present case, there was the additional motive that a sin would merit punishment—which would, of course, be banishment to Earth, good old Mother Earth, who would comfort and shelter her offspring."

Ferguson gestured Drew to follow him out of the room. As they walked along the corridor, he went on: "That was the problem as we figured it. You can see how successful our solution was. You have the satisfaction of knowing you were in at the start."

It took Drew a moment to connect. "That faked weather report! That sandstorm was just north of the equator!"

"And," said Ferguson, "we had a crew working near there. The supposed sandstorm conveniently diverted them to a spot where we had a fossil planted—some old bone none of the museums

could identify, so it was safe to assume none of our chaps could place it."

They stood talking outside another door. "Once we knew the bait had been taken, we knew the crew would hang around looking for further discoveries."

Ferguson opened the door and pointed to the cage inside. "That was the clincher," he said. "We arranged it so that Horace bolted across the terrain in full view, but not too close to the crew."

Drew looked at the naked, shivering monster and shuddered.

"Effective, isn't it?" said Ferguson. "He's going back to Earth next shipment. A few doses of thallium acetate made him hairless, but even so, if he was sighted again, one of the anthropologists might recognise him as a gorilla."

Drew was glad when the door was closed and the ape was out of sight. "Do you think the colony is stable now?" he asked. "Won't the fear come back when no more 'Martians' are seen?"

"Not necessarily. I think they'll build a legend. Horace,

there, will change shape a thousand times in the telling. Hunt The Martian will be the main diversion for a long time. And by then—who knows? There are some species of cat which live in trees."

Drew was uneasy on another point. "You said two weeks ago that I was the one most likely to commit the next murder. Why?"

Ferguson dismissed the question easily. "Of all the colony, you were the only one who hadn't heard about the discovery of the fossil. You had been too busy working and worrying about your wife. I gave you a holiday to put you back in circulation. The rest followed."

Drew wasn't satisfied yet. He had a final question.

"Now that you've told me all this, aren't I still a potential killer? And what about yourself? You and I—and the other directors—we know the whole thing was a fake."

Ferguson paused at the door of his room.

"But do we? There's one thing I haven't mentioned. That fossil that was found—it isn't the one we planted!"

Reply Deferred

Johnathan Stones



zak

The messenger had travelled a long,
long way for a long, long time.
It was only to be expected that it
wasn't as efficient as it should have been

ALGO DID NOT FEEL IT FOR some time after the influence had started. It was almost imperceptible at first and he was very tired. Now it was definitely stronger—he could detect it. Relays tripped sluggishly, allowing minute quantities of electricity to flit through the ranging units. There was not much to spare and he had to be very careful. But the drift was positive. No longer the vague directionless wandering in the void. Here was a light source which had substance—attraction.

The rate-of-motion senses in Algo twitched in awakening anticipation. There was energy in that direction. Energy for the recharging of the billions of storage cells covering the entire surface of his body. The prospect sent a quiver through his depleted organism. Life, at last, seemed

to whisper and beckon to him.

How long he had drifted out there between the smudges of light he had no means of knowing. The circuits had cut out long ago and there was no record of the time interval. He could not even remember when he had stopped recording. It did not seem to be important. But the heat source was tantalising. He probed out toward the source, but the impulse was too weak; no answering echo returned. If he waited, the drift would carry him nearer. He could try again later. There was nothing he could do but wait.

The cells at the tip of his antennæ were the first to register the hard radiation. They started a renewed awareness. This was energy, raw and unmodified. Only minute quantities so far, but definitely increasing. He was heading the right way. "

As each stray cosmic particle streaked into his body they were greedily absorbed and stored. A ripple ran through the cells glimmering dully in the exhausted matrix. Algo drowsed, basking in the delicious warmth of radiation. It was only when the flush of slowly revived life had percolated the farthest extremities did he turn his attention to his surroundings. He had missed it. A giant red star slid beneath him, out of his reach. Yet there were more ahead. Hosts of them, strung out in a great galaxy. He could not miss.

Range and direction circuits warmed and hummed, taking bearings on the nearest. He summoned all the resources available to head in toward that blue-white star, but all that happened was a two-degree shift in his course. The effort temporarily exhausted him. But the searing blue-white star irradiated his surface, flooded back the energy expended, and only deflected him another three degrees. He passed it more than a light year away.

The cluster thinned out

again. By now all the circuits were working. It was becoming easier to differentiate the various radiations. As they were isolated, their patterns were projected against the resolver. Memory banks disgorged statistics and fed them into the comparator. Filaments glowed and relays chattered as the impulses flowed inward. Little pulses of electricity generated ions swerving in magnetic fields. Traces wove intricate patterns beneath the critical eye of the analyser. Then, quite suddenly, they stopped.

The comparator had cut the flow of tapes hurtling through its receptor, and locked on. Spectrum exact; density precise; age within tolerance. Dead ahead—distance eight light minutes.

A shadowy body intruded from the left, moving on his ecliptic. His range and rate computers chattered rapidly. The result assured him that he was on a collision course. An immediate calculation, involving velocity and his kinetic energy, showed without question that he would hit the intruding planet. It was a

small one, but dense, and he could already feel the gravitational pull of it. It was impossible to avoid it, even though he exerted his maximum effort. But he could make a decent landing.

The descent through the atmosphere was distinctly unpleasant. His refrigeration equipment was working full blast to keep his skin temperature down within safe limits. Worse, the deceleration impulses he had to exert drained away much of the carefully husbanded reserves of energy in his cells. Algo flattened out his almost vertical approach path and skimmed low above a wide ocean of a polluted hydrogen-oxygen complex. The liquid was grey and cold, and the surface was undulating in an oily swell. His passage ruffled the surface in a hard line just beneath his mid-section. Observation of this phenomenon absorbed much of his recording and analytical equipment, because these were new and not found on the planets he had left. The atmosphere of gas he hurtled through still caused him discomfort. It

may have been these factors, coupled with sighting solid land dead ahead at the same moment as his speed dropped below sonic which caused it. Certainly it was unexpected. The next second he was ploughing through the liquid in a smother of spray and steam.

The change of environment to Algo simply meant readjustment. In less than ten micro-seconds his perceptors had responded and restored equilibrium. He was now travelling fifty feet beneath the surface and losing speed quickly. The resistance of the water very soon absorbed all forward motion and Algo sank gently to the bottom. The ooze squirted up in a cloud as he plumped into it, and for a while cluttered up his observation. It did more—it entirely cut him off from the source of energy upon which he utterly depended.

When the mud had settled sufficiently for him to take some bearings, Algo heaved himself wearily off the ocean bed and, travelling slowly, worked his way into the

shallows. A smooth sandy cove offered a safe recharging place and he surged ponderously half up the sloping beach. Opening every skin plate to maximum absorption, he lay in the weak rays of a pale and tenuous sun and mopped up what little energy reached him through the thick and turgid atmosphere.

It was low tide when he arrived and he was about to move higher up the beach when the sun set and left him in darkness. There was no point in moving further; besides, the landing on this peculiar planet had depleted his reserves far more than he had thought. He decided to await until the planet turned on its axis. When it did, he was disappointed. A heavy concentration of water-vapour obscured the pale orange star and all he could get were useless radiations.

Toward the middle of the third day, Algo moved. He had to find a more reliable source of power than this wretched sunlight. His perceptors had located a low-energy field existing inland.

It was feeble, but steady. He rolled cautiously across the sand and, skirting a line of metal rods, passed between a tall, intricate and surprisingly hard variety of plant life to an open space. He halted to scrutinise the movement going on around a structure immediately ahead. A flat plate, of the same substance as the plants around him, was being lifted and lowered over the mouth of what appeared to be a fine recharging berth. There was power inside there, he could sense it quite distinctly, and a tremor ran through Algo's tired body.

The movement around the berth at last ceased and some small, rather fuzzy looking shapes, went away. Algo waited for some time until he was sure they had gone, then eased himself carefully across the smooth, hard surface in front of the structure. The berth was sealed off by the flat plate and he explored the edges with the end of his antennæ. There seemed to be no way of opening it without pushing it down. The problem was fed back to his memory banks and almost at once an

impulse triggered off his personal code signal.

The plate shook, lifted slowly, tilted backward and slid up along the ceiling. Algo moved quietly forward into the berth looking for the power point. That the plate slid back into place when he brushed against a knob on the wall only caused a score of micro circuits to pulse momentarily as the data was recorded and stored away.

At the far end of the berth there was a detectable shimmer of electrons. It suggested power. Algo approached. His antennæ delicately explored the work bench. There were small tools, pots of paint, unidentifiable junk—all surprisingly primitive he decided. Then he turned his attention to the slender metallic tube along the wall. A closer inspection confirmed the worst. Only a feeble field, not worth bothering about. But he was in great need of simple electricity to scrub the static off his more subtle circuits. A rod protruded and tentatively touched the pipe with its tip. The metal glowed briefly and a blob struck the

bench with a hiss. For an infinitesimal instant energy flowed into him as the capacitors sucked off their charges. Simultaneously, a small black box high on the wall burst into flames. Algo snuffed it out with one brief squirt of gas. Unexpectedly, it told him that behind it lay the source of energy he desired. It was a guardian, he decided, and promptly destroyed it. The power cables jutted naked in the gaping hole and Algo made connection, drinking greedily.

The traffic signals changed and the gleaming convertible surged forward. Chester Schultz beamed expansively and glanced at his wife. There was an expression on her long, determined face which told him she was a good deal more pleased than she would have admitted. For the first time in years she was literally purring. It did him good to observe the pride of possession it gave her. More, the sense of superiority she already exuded as they rolled effortlessly toward their Long Beach home.

Schultz speculated mildly upon the acid reaction there would be in their neighbourhood when they drove up to church tomorrow morning in the biggest, slickest, most up-to-the-second automobile in the whole county. Loise would revel in the envious glances and smile glowingly upon all her friends.

A man reeled off the sidewalk. A drunk, thought Schultz, instinctively touching the horn button. The mellow chiming notes surprised him. It also surprised the drunk. In one bound he regained the safety of the sidewalk, then turned and stared as the car swept past.

"Sure is some tooter that," observed Schultz. "Guess that guy got an earful. Glad I had them fix it before we took delivery. Sounds swell. Listen." He touched the button again. The sound delighted him. Like a child with a new toy, he found every opportunity to use it and often without any at all.

Mrs. Schultz unbent sufficiently to smile at him occasionally, but usually at those they overtook. Quite

suddenly the novelty wore off.

"Quit making all that noise," she demanded. "I'm tired of it. Can't you make it play another tune?"

"The man said I could trade it in if you didn't like it," replied Schultz soothingly. "Said he had other tunes."

"Then have him change it. For pity's sake. Sort of makes me feel cold."

"O.K., honey. Just as you say."

A lot of the pleasure of the new gadget had already evaporated in that short exchange of words. He felt a little hurt and angry. Should have got Loise to hear the thing, he thought, before deciding on this particular one. Plenty to choose from. But this was the biggest. As an after-thought, he added: "Pity. I thought it was swell."

Loise did not answer. He left it at that and smiled inwardly. So far, she had only heard half of it. She would see the other when they drove up to the garage. Schultz barely suppressed a chuckle as he thought of the look of amazement that would appear

on her face when he sounded the horn. The nine notes, tuned and synchronised to an audio lock on his garage, would trigger off a motor and, wham—the door would lift and slide out of sight under the ceiling. No more mussing up of shoes or getting soaked on a wet night. He liked it—so would Loise. It would appeal to her sense of rightness.

Schultz drove slowly down the street towards their house. It was early yet and many of their neighbours were pottering around their gardens or just talking over the fence. Heads turned unhurriedly as they rolled past. Loise was smiling and waving to someone. Across the street, Ed Sommers looked up and dropped the shears he was using. Schultz waved to him cheerfully and grinned. He was so gratified at the blank expression of wonder on Ed's face, he nearly missed their drive. He negotiated the pair of cedars like giant gate-posts, after some rapid wheel turning, and they were home. The wide tyres brushed the gravel

in a most gratifying manner and Schultz braced himself for the climax. The moment was upon them. Loise did not know anything about the audio lock yet. He had had it fixed while she was in town shopping this afternoon. His spirits were at zenith and he was enjoying himself immensely.

"Now, honey," he said excitedly, "just you watch ahead. Keep your eyes on that garage door."

He brought the car to a standstill.

"Watching?" He turned to see her already alighting. "No, Loise, sit still."

He had his finger poised over the horn button. "Now," he declared triumphantly. The notes chimed out. In the enclosed space behind the house, the sound was arresting. Loise flinched, but her expression did not change. Schultz had been studying her face for the expected reaction. When the glow of her recent triumph began to fade, he knew something was wrong, and he glanced at the garage door. It was still firmly shut.

He pressed the button again. Incredulous that it still did not respond to his signal, he tried once more.

His wife bounced half out of the seat, glaring back at him. "Quit playing with that thing, Chester. You'll have the neighbours thinking you are showing off."

"Told me he had fixed it proper," muttered Schultz, still unable to believe his surprise had fallen so flat.

"Fixed what?" demanded his wife. "Sure he fixed it. The loudest darn tooter this side of Boston. Quit jazzing the thing."

"But he said he fixed it," persisted Schultz doggedly, "this afternoon."

"Well, he didn't do it very well." She sniffed disdainfully. "Fixed what, anyhow?"

"The door." He pointed ruefully at the garage. "Should open when I sound the horn. Tuned, the man said. Should open at once." The explanation was as wretched as he felt.

His wife strode around to his side of the car, favoured the garage door with a wither-

ing glance and reached inside. She jabbed the button with her palm and kept on pressing it. Sound filled the back yard and flooded out into the adjoining property. Above the noise he could hear her saying, in a very determined voice: "If it is supposed to open, then it is going to open, and fast, or we'll have everyone round here wanting to know what all the racket is about."

And then it moved. Slowly at first, it rose a couple of inches and then started to cant outward at the foot, the top beginning to curve away toward the ceiling.

"There, what did I tell you?" she declared triumphantly. "It works O.K. You did not try hard enough." She glanced disdainfully at her husband and turned to observe the smooth action as the door tilted and slid out of sight. "Sure is dandy, yeah. I guess I'm goin' to like it. Say . . . what's that in there?"

Schultz squinted through the evening sunshine into the shadowed interior. "Just some trash the men left, I guess, when they left," he suggested

mildly. "Only take a moment to . . . hell . . . You see that? It moved."

His wife clutched him convulsively. "Sort of slithered. Chester . . . It's alive. Do something."

Confused and scared, he could think of only one thing. He pressed the horn button.

Algo was replete—he had charged his storage cells until they glowed and pulsed comfortably. Now, fully functional, the immediate problems of survival solved, he checked quietly over the detailed instructions in his memory banks. Something equivalent to an alarm twittered inside him as the self-preservation quotient snapped into a calculation he was solving. The small yellow star was not his target after all—it was the third planet in the system. A rapid analysis of recently recorded data assured him he was already there. His task was now fairly straightforward.

The approach of the machine, on its queer round supports, caused Algo a mo-

ment's concern. If this was the principal guardian of the energy, then it might be advisable to disconnect in case of a power surge. He had had all his rectifiers destroyed that way before, trying to even out a fifty million volt shock. He sent an exploratory impulse toward the machine, which had now stopped just outside the berth, aiming at the faintly warm metal box in the front. He waited, puzzled at the silence. It seemed to be dead, although there must be some life in it—it had heat.

It was the impact of the sound, precise in the nine frequencies, that did it. Algo quivered all over. Not for an unimaginable time had he heard those clear, discreet notes. The whole of his operational control circuits hummed expectantly, setting up an entirely new configuration of response. His perceptors snapped from AUTO to COMMAND. Deep within, power surged, sighing a little as equilibrium was established. He was ready.

The nine notes chimed out again precise on his fre-

quencies and another relay snapped closed. Power rose to meet the new demand. Algo felt the third relay close and the tension heighten. Then part of the machine moved away, coming towards him. A small object, fuzzed around the outline, and made of some complicated hydrocarbon, seemingly supported on a calcium structure. The iron complex inside the hollow calcium tubes bothered Algo. There was absolutely nothing in his memory banks to suggest an identification for the thing. It had gone around the machine to the other side now and was close to another similar thing crouched inside.

The rapid repetition of the notes, still in their proper cyclic order, with the corresponding polarizing of his internal forces, temporarily distracted Algo. The ninth relay closed with a snap and the arming of the COMMAND circuits was complete. Algo was now fully activated; he hummed faintly and waited.

He watched the door rise and fold back against the ceiling. Its removal slightly sharpened the image of the

machine waiting outside. It was at that moment that the re-adjustment to his outer surface took place. Algo assumed a spherical shape.

For longer than he could recall, he had no means of knowing now that his chronobase had been interrupted, he was again under full audio control. A million horsepower lay poised beneath the dull grey spherical outline of his pulsing body, every cell, perceptor, and circuit tuned to obey the command he awaited.

It was the unexpected and perplexing repetition of the code signal for the tenth time, once too many, which precipitated matters. Algo literally shuddered. Impulses which should have moved smoothly in the same directions now crossed, negatived themselves and set up tensions of enormous complexity and power. Energy surged wildly through his body, was snuffed out and re-routed to be checked again. Erratic, unmodulated motions were triggered off, countermanded and transferred to the secondary level of delayed action. He was already confused with

several circuits jammed. If they were not cleared before the next command almost anything could happen.

Ed Sommers watched the shining convertible enter the drive between the two cedars and disappear from view. His immediate surprise slowly changed to mild speculation. Chester Schultz, he mused, was not the rabbit he seemed. True, he played a frightful game of golf and a worse hand of bridge, but he evidently knew something about the wholesale grocery business. That enormous, scintillating, green and amber vehicle, resplendent in chrome plate wherever it was possible to stick it, was certainly striking, but it was hardly Chester's type. Much more likely Loise had had a hand in the choice. That being so, tongues would very soon be wagging. He was almost certain he could hear his own wife on the phone now. He bent down to retrieve the dropped shears, thinking of the inordinate importance women gave to the doings of other women, the darlings.

He was idly inspecting a tuft of grass adhering to the point of one of the blades without any particular urge to remove it, when he heard the ululation of Schultz's new horn. Ed Sommers raised his bespectacled head and peered rather short-sightedly in the direction of the noise. He had heard some fancy hooters, he reflected, but never one like that. The repetition increased his interest. Loise again, he surmised—she loved gadgets, particularly noisy ones. He smiled quietly to himself in good-natured understanding. He knew Loise—ought to have done by now, having been at school with her. Why, he had courted her for a time, but that was many years ago. Twenty years was it? Funny thing she should come to live right across the street from him. Fine house she had, with a big lot reaching right down to the beach. Pity they didn't have any kids—the place was ideal for them.

It was the sudden and continuous braying of that nine-toned hooter which snapped the gentle and friendly

train of thought in Ed Sommers' head. He ran slender fingers through his thinning sandy hair and frowned. Something wrong over there. He put down the shears and then hesitated. Instinctively, the idea of intruding upon their privacy restrained him, particularly at this moment. It would look too darn curious if he walked in on them. But the noise was still flooding out across the neighbourhood. Others were turning their heads inquiringly. On impulse, Ed Sommers crossed the street and entered the gap between the cedars. He had no clear idea what he would say or do, but if his guess was right, Chester was having trouble with that new hooter of his. Switch stuck, perhaps. As a consultant engineer, he had a fair knowledge of the working of most mechanical and electrical things and was in no doubt he could solve the trouble in a matter of moments.

The shingle of the drive scuttered as he increased his pace to a trot, and as he rounded the corner of the house, he nearly ran into the

back of the convertible. Chester was in the driving seat with Loise standing by his door, and both were motionless, staring into the garage. Then, quite suddenly, the noise stopped. Rather abashed, he started to retrace his steps, his ears still ringing, but it was something Loise shrieked which halted him. Something about slithering and being alive. He turned back at the precise moment Schultz pressed the button again.

From where he stood, irresolutely, he could see past the car right into the garage, and he saw the shadowy shape move, or rather it shuddered. The sight sent queer little ripples of fear up his spine and he teetered between holding his ground and making a run for it. There was a quality about that movement outside his experience, and the shape and colour of it, now that his eyes were becoming accustomed to the gloom in the garage, brought a crop of new emotions into his startled brain. He just peered, goggle-eyed. Then, gradually, fear gave way to

professional interest, for this was some kind of machine—a machine in fact of most extraordinary design. He could not begin to imagine what its function might be, or its possible use. Curiosity overcame discretion. He stepped forward.

"Hi there, Loise, Chester. Nice little buggy you got there. What's the gadget you have in the garage? Never seen one . . ." The words trailed off as he studied their faces. Sheer panic and paralysed horror had frozen their features into queer grins. They seemed to be unaware of his presence. He leaned into the car.

"Say, what has gotten into you two?"

Very slowly, they turned to face him, the horror melting gradually away, but not the fright in their eyes.

"W—w—what is it?" hissed Loise hysterically. She was still clutching her husband and glanced apprehensively back at the garage.

"Thought you could tell me," began Ed Sommers, his assurance and interest in the

queer machine taking on another quality. "Didn't you have it put there this afternoon? Clare said as how some men were working around here for a couple of hours."

"Fixing an audio lock on the door," Schultz said jerkily. "Nothing else. Thought it was some trash they'd left. Then it sort of moved." He shook his head perplexedly and seemed to take comfort from his friend's presence. "Glad you stepped over, Ed." He was recovering his poise quickly. "Guess we better have a look."

Loise let out a queer little whinney and grabbed at his sleeve. "No. Don't go near it. It's alive I tell you. Chester, I absolutely refuse . . ." But he had slid along the seat and was getting out the other side. He gave Sommers a nervous grin and they both faced the garage. "Chester." The tone of his wife's appeal was harsh with apprehension. "Don't touch it."

"O.K., honey, I won't. We'll just take a look see."

Together, they moved cautiously toward the thing lurk-

ing in the shadow of the garage.

"Big," murmured Schultz, "and round, like a big ball. What do you reckon it is, anyhow?"

His companion grunted, his whole attention focused upon the pair of antennæ rising from the top of the sphere. At the threshold they halted, uncertain what to do next. Behind them high heels beat a rapid tattoo across the concrete toward the house.

"Durn funny looking. What do you make of it, Ed?"

"Stay here, Chester. I'm going inside to have a closer look." Sommers stepped lightly into the shadow and skirted the thing, keeping his back to the wall. It did not appear to be any different around this side, he decided, and told Schultz so. The thing did not react to his inspection nor give any sign of life. Emboldened, Sommers glanced around the garage. At once he saw the gaping hole where the meter and fuse box had been.

"Say, Chester," he called. "Someone has been tearing

your place about." Schultz cautiously joined him and they regarded the destruction together. "Wilful, senseless hooliganism," pronounced Schultz hotly. "Dime to a dollar, it was those wild kids from over the tracks. This is probably some of their work, too. Phoney spaceship or . . ." He turned swiftly and snatched a hammer off the bench. "Trying to scare us into thinking it is a bomb or something." He hurled the weapon angrily at the thing.

Algo detected the missile and reacted. The hammer dissolved immediately into sparks and a puff of smoke. Dumbfounded, the two men stood stock still, gaping at the fantastic. It was some moments before either found words.

"Good grief, it's real," breathed Sommers unsteadily.

"Man. Let's out of here." Schultz put action into his advice and ran for the yard. Sommers followed, keeping his back to the wall and his fascinated eyes on the thing in the centre of the floor. Loise appeared at the door of the house.

"I've called the Fire Dept.," she called. "They'll be right over." Then, noticing the set expressions on the faces of the two men. "What is it, Chester? You touched it?"

"Well, no. Not exactly. Pitched a hammer at it. Just vanished in smoke." Schultz spoke over his shoulder, his gaze still rivetted on the grey, enigmatic sphere.

"Come inside," called his wife. "No, move the car round the front. You're in the way there."

Sommers helped him. "Loise was always practical," he observed when they were out of sight of the garage. Schultz nodded absently and headed into the house.

"What do you think we should do?" Schultz asked, when they were safely in the kitchen overlooking the yard.

"Nothing," snapped Loise. "Let the Fire Department handle it. They know how. Listen, they are here now."

A howling of sirens grew and erupted into the drive. A huge engine and a motorcycle patrolman swung to a

stop in the yard. The fire chief hitched his trousers and sauntered over to the house, having taken a quick and experienced glance around.

"Where is the fire, lady?"

"Not a fire—a thing. In the garage," called Loise through the window.

"A what?" The fire chief looked puzzled and not a little truculent. "Lady, we're the Fire Department, not the Garbage Collectors. If we've come on a wild-goose chase . . ."

The patrolman interrupted him.

"Mr. Schultz, your wife reported a dangerous object in your garage. Care to show me."

"Chester, don't go near it. I've warned you." His wife was becoming frightened again. Her imagination and intuition doing strange things to her larynx. It did not stop Schultz going out, although he felt strongly in favour of staying away from that thing. It was with measurable relief that he noticed Sommers following him.

He pointed to the garage. "In there," he managed to say.

"Grey, spherical object, about eight feet diameter," added Sommers. "Must be some advanced mechanism, for it dissolved a hammer we pitched at it." Nobody seemed to hear the last sentence.

They peered at it for a while, uncertain what to do.

Then: "Do it again," suggested the fire chief. "Don't make sense to me."

The patrolman picked up a stone and lobbed it at Algo.

Being a good deal lighter than the hammer, Algo merely stopped it in flight a foot from his surface. The stone hit the ground and stopped rolling.

The fire chief regarded the other scornfully, and casually unhooked an axe from the engine behind him.

"Pebbles, chaaw," he taunted. "You coppers need men to help in clearing up kids trash. Watch." He hefted the axe, making the blade flash in the sunset light.

"Got an axe here," he called. "If there is anyone

inside that thing, sing out before I pitch it. I'll give you ten seconds."

They all stood watching the grey sphere in the shadows, waiting for some sound or movement. But none came, despite the fact that Algo had received a code word and had already reacted to it. Ax was the precise mnemonic for FIRE.

The fire chief had counted off the last three seconds.

"O.K. You've had it." He swung the axe. "Here it comes."

The weapon curved from his hand with a dexterity suggesting long practice and flashed toward the target.

Algo vapourised it and sent it back in a fine gaseous squirt of high carbon steel. It went over the fire chief's shoulder close enough to blister his cheek and struck the engine. Instantaneously, the fire-fighting machine burst into flames. Three seconds later the petrol tank exploded and the yard became a sea of fire.

"Holy cow, I can see the headlines now," muttered the

fire chief as he put down the phone in the safety of Schultz's study. "'Hook and ladder starts devastating fire'." He shrugged helplessly. "Never live that down." He turned to his distressed and unwilling hosts. "Don't worry, folks. They've got three more wag-gons on the way now." He scratched the back of his neck. "Just can't figure that out. Blowing up like that. New engine, too. Very latest. Must have been a backfire or sumpin'."

"But . . ." began Sommers, "it was the . . ." Then he closed his mouth. He was convinced that the sphere had dealt with the axe in the same manner as the hammer Schultz had thrown at it, but the chaos in the yard had evidently so distracted the attention of the others to enquire where that axe had gone. He had no clear idea himself. Furthermore, what he was thinking was fantastic. Hammers and axes did not just puff off into gaseous metal at thousands of degrees Centigrade unless there was a very noticeable source of heat to boil them. The sphere

had been perfectly cold as far as he could recall.

Further distracting conjecture became impossible. The arrival of the three new appliances emphatically denied constructive thought. Two minutes later, however, the incandescent skeleton of the fire engine in the centre of the scorched and blackened yard was transformed into billowing white mounds of foam.

"There now," announced the fire chief, whose name they discovered was Maguffy, "no time at all and everything right as rain. Any time you have a fire just you call us. We'll fix it." With that he ambled into the yard and looked keenly around to the accompaniment of a further hitch of his belt. "Now, where were we? Oh yeah. Hey." The last observation was of genuine surprise. "Where is it?"

They all looked. After three minutes they were satisfied the thing had gone. "Burnt to a cinder, I shouldn't wonder," said one of the crew of Maguffy's engine, wiping the sweat off his sooty face. "Now we'll never know."

"Know what?" demanded Maguffy, taking another look into the empty garage.

"What was inside it. You never really know 'til you open 'em up. I like doing that."

Maguffy suddenly appeared to remember something. He rounded on his crewman. "Hey, who found that blame axe? The one I pitched."

Nobody had seen it and another futile search started. Ed Sommers held his peace until they showed signs of mystification. Then he asked Maguffy what blistered his cheek. The ensuing discussion was lamentable in its lack of progress toward understanding. Not one of the dozen or so men in the yard would listen, even civilly, to the explanations Sommers suggested. Maguffy even laughed in his face. They did not notice the patrolman edge over to where Schultz stood disconsolately eyeing the wreckage of his back yard and ask him:

"Say, ain't that Mr. Sommers an engineer or something?"

"Who, Ed? Sure. He's a real big shot scientist in the city. Knows about most things, except grocery. Fixed up my T.V. real slick when it went..."

"O. K., Mr Schultz. Thanks." And he made for the house. He was back in a minute, looking pleased and rather important.

"Just a minute." He held up his hand. "Hold it, there. No one to leave the grounds of this house. Police chief's orders. Whatever it is, he reckons it is dangerous. There is an all-car alarm out, and the district will be combed thoroughly."

Loise had kept very quiet during the recent proceedings, but at mention of the thing being officially dangerous, she let out a squawk and yelled at her husband to come inside. Schultz ignored her. Instead, he went over to Sommers and drew him aside.

"Ed. Where do you reckon it has gone? The beach?"

His friend screwed up his eyes thoughtfully. "Could be," he agreed, after a pause. "Quieter down there. If it is capable of figuring things

out for itself, it is just where it would go." He glanced around at the group of firemen arguing with the patrolman and, grasping Schultz's arm, propelled him out of the yard and into the trees. Their exit went unnoticed. "Fine," said Sommers, "now let's go see."

"See what?" exclaimed Schultz hanging back, the patrolman's words echoing faintly in his head. "You don't mean you are going after that thing? Why, Ed, you're crazy. It's dangerous."

Sommers regarded his companion steadily for a moment. "Can't speak for you, Chester, but I'll not sleep good in my bed tonight until I know where that thing is. I just want to see it and I won't even heave a rock at it. You coming?"

"It's a job for the police, Ed. What the heck do we pay taxes for? They'll find it—can't have got far—and they'll fix it. Blow it up or take it away. What do we know of these things?"

"About as little as the others," Sommers assured

him and, with a deprecating shrug, turned and started off through the trees toward the beach. Apprehensively, Schultz followed some paces behind. He admired his friend's courage, but the prospect appalled him.

They had gone about fifty paces when Sommers suddenly stopped and signalled for silence. Somewhere, just beyond the screen of scrub and out of sight below the low bank, had come a sound. They listened intently. It came again—a low crooning sound ending in a childish gurgle of delight.

Sommers went forward and peered through the branches. "It's only the Embert child," he said, smiling as Schultz joined him. "Nice little kid—intelligent and independent. She's coming along the beach carrying something in her hand." She was plainly entranced with it and paid no attention to their calls until Sommers dropped down on the sand near her. Then she only glanced up with a smile and resumed her enraptured gaze

at the shining object she held.

"Hello, Katey," greeted Sommers. "What you got there?" The object was so obviously metallic and expensive looking that he found it odd that someone had thrown it away. "Let's see." He held out his hand. Katey hugged it protectively to her and glared at him. He tried again and was met with an angry scowl.

"'S mine. Pretty box. Want to keep it." Katey made a show of stubborn possessiveness and edged around him. "'S mine," she declared emphatically.

Sommers hunkered down. "I'm not going to take it, honey. It's yours, I'm sure." He grinned amiably at the child. "Just thought I might get one like that for myself. Where did you find it?"

She was coy at first—then quite suddenly relented and pointed along the beach. "Show you. C'm on," and she trotted ahead.

There had been something unfamiliar about that shining metal tube in Katey's hand.

It could be some new brand of cigar case he had not seen before—it was about that size. And yet . . . He was becoming suspicious of everything this evening. "Wait," he called. Katey took no notice of him and ran on toward the low bank which formed the end of the small curving beach. On this side it was a steep sand dune dotted with stiff grass, but on the other side it fell away abruptly into the cove where they kept the small boats.

Sommers hung back until his companion joined him. He was already breathing heavily. Together, they trudged through the soft and clogging sand. By this time the little girl had reached the dune and was clambering up, using the tufts of grass as handholds.

"Take it easy, Katey," Sommers called. "Stay on the top."

The two men watched her climb to the top and look back at them. Then she pointed at something they could not see. "Here." She jumped up and down excitedly, still pointing. Some strange urgency impelling

them, they broke into a shambling run, the wind-blown sand slippery under their feet. They had nearly come to the point of the bank when they saw her bend down and lay the object carefully at her feet. Then, smoothing her frock as if to gain added courage, she stepped off the top of the bank and disappeared.

Sommers let out a cry of dismay, visualising the child already hurt and sprawling beneath the low cliff beyond. He bounded forward and rounded the point at top speed. What he saw brought him to an immediate halt. The little girl was standing on a great boulder half buried in the face of the cliff. She was clinging to what looked like a sapling growing out of the top of the oddly smooth and curving rock.

It was not relief only at the child's safety that caused him to stop so suddenly—it was the fact that, for as long as he had known that little cove, there had been no boulder beneath the cliff. There was no explanation for its pres-

ence at all. Sommers just stared at it stupidly. Schultz caught up with him and stopped.

"Where is she? Oh, there." He answered his own question and waved at the little girl. "Hi, there, Katey."

"The rock. Never seen it there before." Sommers was still struggling with the unfamiliar.

"Rock? Sure, she's standing on it. Must have . . . Rock? Ed . . . it isn't . . . a rock." His voice had taken on a note of horror. "It's the . . . thing."

Stunned by the implications, neither moved for a full three seconds. Then Sommers gathered his scattered wits sufficiently to say, in an unsteady voice: "Don't move, honey. You're right on top of . . ." He checked himself and changed it to "you might slip off. We'll come and get you."

Katey evidently had no idea what the thing was and seemed delighted with her discovery. "Look," she cried, "big ball-ball. I found it. All by myself. It's nice." She

swung joyously about the antennæ, smiling down at them. "Gave me a present, too."

"Oh, God, what do we do?" whispered Schultz distractedly. "What if it goes off or . . ." Visualisation choked off the sentence.

"Get her off somehow, and quick." His voice was strangled. "Get round the back and lift her off if she won't come."

"She may slip."

"O.K., Chester, you go. I'll stay here."

For fully sixty agonising seconds Sommers stood beside the terrifying thing, his skin cringing in anticipation of what it might suddenly do. He could hear Schultz calling as he struggled up the soft dune on the other side. Katey turned her head, but made no effort to abandon her perch. When he was on the top she would not be persuaded and Schultz leaned down to take hold of her. At this she let out a scream of protest and wriggled to the other side of the antennæ. Sommers stepped forward in case the child

should slip, and found himself within two feet of the thing's side. Its proximity, now that he could see it properly, really frightened him. Somehow, it had been different inside Schultz's garage—he had never believed it was real, and certainly not hostile. He boggled at the reality and could not take his eyes off it. It was a dull, mottled grey, shot with a curious undefinable glint as if some fluid seethed beneath the surface.

Then it moved. A rippling motion started at the top and ran downwards. Sommers wildly likened it to a giant caterpillar and stepped back smartly. Before he could turn or do anything, a whoop of delight from Katey made him glance up anxiously. The child, still clinging with one hand to the antennæ, had reached down to pick up a shining thing oozing through the surface of the sphere. She must have fumbled it, for it rolled down the side and fell at Sommers' feet. For a fraction of a second he knew panic. Then he lifted his head and called up to the child:

"Hurry down, Katey. Uncle Chester will help you."

Without another word, the child obeyed and was lifted up onto the bank. Sommers eyed the shining metallic tube lying in the sand and then the great enigmatic sphere, debating whether he dare pick it up. He cast about for a stick to hook it nearer, but the cove was bare. He was still making up his mind when Katey pelted around the point and launched herself upon it.

With both metal tubes clutched in her hands, it was not difficult to lead her away onto the next beach. Schultz looked exhausted and pale from shock. Despite that, he went ahead of them, calling back that he had to "tell some men something."

Sommers got the little girl into the comparative safety of the trees at the foot of Schultz's lot and sat down. His legs would no longer support him. It was there the police found them.

At first the patrolman was officious and rated Sommers

the lowest kind of fool. Phrases such as "not carrying out instructions," and "exposing the kid to danger," kept cropping up. Sommers rose in weariness and strode off with Katey by his side toward the other end of the beach. From there they had an uninterrupted view of the subsequent operations. Incredibly he forgot all about the silver tubes Katey had so smartly concealed inside her frock when the policeman approached.

The area was cordoned off by the mobile police and the firemen ran out hundreds of yards of hose toward the scene of action. The authorities must be taking things very seriously, thought Sommers, when a small convoy of military trucks arrived. The ensuing bustle and preparation intrigued Katey even more. He had to restrain her from jumping up from their vantage point behind the dune to see what was going on at the other side of the cove. Stretched out in the soft sand, he was beginning to enjoy himself immensely. If they kept quiet and lay

low nobody would drive them away and spoil the fun.

It was growing dusk and the figures flitting to and fro across the beach suddenly thinned out and vanished, leaving the beach vacant. Sommers grabbed the child and dragged her down the side of the dune. He was only just in time. From beyond the far point a gout of flame shot up in a violent explosion. Sand stung his face and hands, and for some moments they huddled in a steady rain of debris.

Oddly enough Katey was not frightened—in fact, otherwise. "What a lovely bang," she cried and sneezed. "Can I look now?"

He waited a bit longer, then they both stood up. There was just enough light to see that the far point had disappeared. All that remained was a large sperical object leaning against a narrow wedge of sand sloping halfway up its side.

"Oooo . . . it's still there. My ball-ball," cried Katey excitedly. "Goodey."

A sudden burst of firing

from among the trees in Schultz's lot reminded Sommers of their danger. He flopped back into the sand, cradling the child in his arms. It was small-arms fire only for a couple of minutes with single shots. Then an automatic opened up. He crawled alone to the top of the dune and took a quick look. Sparks and flashes covered the sides of the sphere like a halo, but were not making much impression he decided. Quite suddenly the firing stopped. He was so interested in the half-seen action that he did not notice Katey crawl up further along the ridge and peer over.

It was the throaty cough of a mortar and the whine of the bomb which made him duck back under cover. Almost at once a gun barked—a sharp vicious crack, the sound of an anti-tank gun. Something went wee-ee-fut and ended in a flash somewhere in the trees. The gun fired again, rapidly, the shells exploding in quick succession. Amid the shots, he could hear shouting and an unmistakable scream. Then two pine trees exploded into

vast torches, bathing the area in an angry glare.

With a pang of conscience, he remembered the little girl and hurriedly glanced to where he had left her at the foot of the dune. To his dismay she was not there. Frantically he searched for her, calling her name, but she had vanished. Then he saw her little figure silhouetted against the glare on the top of the dune. She must have heard him, because she turned and called back.

"They are hurting my ball-ball."

Then she disappeared down the far side. When he reached the place where she had been, the child was running away from him across the blood-red beach. Toward her from the far end, moving in a strange, rolling motion, came the sphere.

Sommers leaped down the dune waving his arms and yelling. His throat was so tight he could only produce a croak, but he kept on running. Off to the left confusion had broken out. Men were shouting, ammunition exploding

and everywhere a sea of flame. He did not notice that the firing had stopped; not that it would make any difference now. He had to catch Katey before the thing got her.

He was overtaking her fast, but the tiny figure kept on running. She was not more than twenty paces from the sphere. Then a rock snarled his foot and sent him sprawling. Winded and frantic, he shook the sand from his face and struggled up.

Katey had stopped and the thing was almost on top of her. Sommers let out a cry of despair, then stood still, swaying, his mouth open in astonishment.

The sphere halted in front of the little girl and seemed to roll forward, the antennæ arching over her.

"Oh, poor ball-ball," she cried. "Were they nasty to you?" The things she held in her hands glinted in the flickering light as she raised them to the top of the sphere—then she laid them down. At once they seemed to melt into the grey surface and were gone. The sphere rolled

upright, its antennæ pointing to the stars. For the fraction of a second it seemed to tremble, then it lifted and soared into the night sky.

They watched it dwindle to a speck and blink out.

Shaken beyond belief, Sommers took the child in his arms and slowly went up the beach.

"Do you think they hurt it much?" asked Katey after a while. She looked very solemn. "'Cause if they did, it was my fault. They were not mine really . . . so I put them back."

Algo had reacted to the code word BALLBALL a second time and had received the

answer to the message he had brought. His COMMAND circuits snapped over to AUTO. Gathering his powers, he rose from the face of the small planet and headed out into space. His mission was complete. Taking sights on the nearest stars, he set course for home—according to the data in his memory banks.

How was he to know that it was the wrong yellow star about which the third planet swung—that it was the wrong galaxy—that his home planet had been devoured in a minor nova countless millions of years ago in a corner of Andromeda, and that the inter-stellar war had ceased beyond the measure of time?



Book Reviews

FICTION

STEP TO THE STARS, by Lester Del Ray, published by Hutchinson & Co., 178-202 Great Portland Street, London, W.1, at 10s. 6d., is a juvenile which will appeal as much to grown-ups as to the youngsters.

The story concerns the problems and perils of a youngster, Jim Stanley, eighteen years old, who is trying to work up to the level of mature men on the planet's first space station. Fascinating details of the construction and operation of this station are part and parcel of this tense and dramatic story, and the story breathes realism in every line. The author has taken great care to remain within the bounds of immediate scientific progress and has only used known methods; even the rocket fuels specified are in use today.

To dismiss this book as just another juvenile would be a mistake for all who have some knowledge of the problems attending the building of a space station and who would like to know more.

SEND FOR JOHNNY DANGER, by M. E. Patchett, published by Lutterworth Press, 4 Bouverie Street, London, E.C.4, at 6s. 6d., is another juvenile by an author who is recognised as one of the foremost writers in this field.

It is an outright story of fast adventure with Johnny Danger and his crew. Given command of the first spaceship to reach the Moon, bad luck seems to be waiting for them on arrival. The trip through space is uneventful, but on the Moon itself disaster strikes and the ship is lost. Stranded, with little air and less hope,

the explorers set out to investigate the new world dogged by the knowledge that death is very near.

Naturally, they do not die. They find and investigate strange buildings, meet stranger creatures and, finally, arrive home, triumphant.

The young, and the young in heart, will love this book.

THE YEAR'S GREATEST SCIENCE FICTION AND FANTASY, edited by Judith Merrill, published by Dell Publishing Co., Inc., 261 Fifth Avenue, New York 16, U.S.A., in a soft cover edition at 35 cents, is an anthology edited by one who has proved her fine sense of story value many times.

It contains eighteen stories, the final sifting from those which appeared in 1955, and each story has a preface by the editor, which adds to the worth of the book. So also does the Introduction by Orson Welles. The stories are varied, touching from humour to horror, from introspection to the wide stage of the galaxy itself, and all are highly entertaining. It is books

of this nature which have done much to lift the public concept of science fiction to a higher plane.

NON-FICTION

THE VIKING ROCKET STORY, by Milton W. Rosen, published by Faber & Faber Ltd., 24 Russell Square, London, W.C.1, at 21s., is simply what the title states, the story of a rocket.

But the Viking is no ordinary rocket and this is no ordinary book. The Viking is the single-stage rocket which, in 1954, reached a peak altitude of 158 miles, and in all this book relates the history of twelve Vikings, from the first with its attendant heart-breaking frustration, to the twelfth with some of the problems solved, but still others to face.

But this is more than a dry account of trial and error, success and failure. The author was in charge of the Viking programme and is now Technical Director of the Earth satellite project. With him, we see the Viking through the

eyes of the men who built, serviced and launched the rockets. With them we share frustration and defeat as things, seemingly trivial in themselves, caused expensive and irritating delays. With them, too, we feel success as the rockets soar higher and higher into the atmosphere.

Ground launchings took place at White Sands, and a comprehensive description of the famous rocket-testing grounds, the system of radar control and flight checking is given. Also explained are the telemetering devices and most of these details will come as a surprise to those who imagine that a rocket is something you put a match to and send on its way.

These details, together with tables, forty-five remarkable photographs, including some taken by a Viking-mounted camera from a high altitude, and simple illustrations make this a book every rocket enthusiast will want to own. For this isn't something which may happen; it is something which has happened and already belongs to the literature of the history of space travel.

GUIDE TO MARS, by Patrick Moore, F.R.A.S., published by Frederick Muller Ltd., Ludgate House, 110 Fleet Street, London, E.C.4, at 10s. 6d., is a timely book about the red planet by an author who has become an authority on the subject.

Containing illustrations, photographs, and an extensive bibliography, it will prove of interest to all who are interested in our near-neighbour in space. A well-written, lucid and educational book which will give many hours of entertainment to all.

ALL ABOUT PHOTOGRAPHING INSECTS, by George E. Hyde, Photo Guide 73, published by Focal Press Ltd., 31 Fitzroy Square, London, W.1, at 2s., is a highly interesting little book full of photographs and information on how to take close-ups of the insects around us.

Anyone who has a camera, and who wants to take photographs of creatures which appear far more alien than any fictional concept, will be well-rewarded with the information given.

Discussions

CALLING MR. CROCKER!

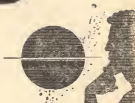
In reply to Mr. Crocker's theory in issue No. 68, may I make the following comments?

If everything is expanding at a uniform rate, then we must expand at the same rate. Now, if in a certain time lapse the expansion is x times the dimension before the measured time interval it follows that a human's height will increase x times; his cross-sectional area x^2 times and his weight x^3 times. As strength is a function of the cross-sectional area of the muscles, it follows that, at the end of the time interval, our specimen human would be less strong than he was before, due to weight increasing faster than actual strength. So, after a short time—or expansion—our specimen human would weaken until he collapsed under his own weight. The same arguments, of course, apply to all animals and materials. It seems to me that this expansion on the atomic scale could progress in the following ways:

The molecular distances expanding while the atomic distances and sizes remained constant.

The atomic distances and sizes expanding with or without molecular distance expansion.

The overall ratios remaining constant; i.e. everything expanding uniformly.



The following objections are raised.

Within a short space of time the molecular bonds would be so weakened by the expansion that the molecules would disrupt with disastrous results.

The atomic bond would be weakened to such an extent that atomic disruption would occur in a short space of time.

If the atomic particles expanded uniformly, then surely the internal gravitational force would weaken to such an extent that complete and total disruption would follow.

If, as Mr. Crocker asserts, gravitational forces are an effect, and not a cause, what holds the electrons—and planetary bodies—in their orbits, as both centrifugal force due to rotation and expansional force would tend to hurl them out of their orbits?

I am completely in agreement with Philip Harbottle when he declares "your mag is tops" and am highly appreciative of your

comment that well-written space opera is no longer space opera.
V. L. Blond, 2 Rockburn Crescent,
Bellshill, Lanarkshire.

If everything expanded at a uniform rate, atomic distances, atomic charges, etc., would we notice a difference? Alterations in size can only be measured against a static device. If a man doubled his height, and a rule doubled its length, would the man have grown? And expansion of atoms would increase size, not weight. The man would still have the same mass; it would merely take up more room.

NO WOMEN

Authentic has improved in the past year, of that there can be no doubt. The articles are more interesting and well put over. The stories, with a few exceptions, still make good light reading. However, you are still a long way from being 100 per cent.

The two-part novels have, with the exception of *The Lady and the Bull*, been very poor. Your short stories are still of the best, but for a few, which seem to be sinking into a sort of domestic drama with some science put in for good taste. If we want to read about wives, mothers, sisters or girl friends, etc., I don't think science fiction is the place to look for them. Humour the same. I tend to agree with R. Wild, No. 67, that you have unreality creeping into the stories; i.e. *Reluctant Death* and *The Room*, No. 65. These are not the type of story one looks for in *Authentic* of all places.

Peter E. Wilson, Lonhurst Lane,
Lonhurst, Morpeth.

Over one half of the world's population consists of wives, mothers, sisters, girl friends, etc. Can we ignore them?

LITERARY LINE-UP

My heartiest congratulations on issue No. 68! From adolescence to adulthood in two months, and an adulthood which bears comparison with the leading publications in the field!

What an improvement, not only in the quality of the fiction, but in the general presentation. I hope that the peculiar mixture of small and large print, and those terrible photographs, are gone for ever. My own choice of stories in this issue is as follows:

The Deciding Factor, with special merit for keeping the reader guessing throughout. A skilled performance.

Cure for Dreamers, a very good "twist" ending.

Act of Courage, high average, marred by the unnecessary intrusion of McGregor and his unmertry men.

Secret Weapon, good, but rather "typed"; characterisation was rather poor.

The Dilettantes, one feels inclined to say "so what?"

According to Tradition, a caricature more than a story. Competent.

The Letter, good. Down-graded in this analysis only because the feminine viewpoint does not appeal to me.

Mr. Culpeper's Baby, well-written, but why written? Leaves an unpleasant aftertaste without even the justification of illustrating a point

of view or of pointing a moral. Tragedy is justifiable, but not in this form.

Suggestions for the future? Single column instead of the double column, which, on such a small page, causes something akin to visual claustrophobia. Do S.F. magazines have to have an illustrated cover? Of their type, your covers are good, but I deplore this choice of cover. I am frequently annoyed because people who, if they could overcome their instinctive prejudices, would enjoy S.F., are put off by the covers. Why not a monochrome background with the title and nothing else?

John F. Barrie,
c/o Cullen, 18 Bellsdyke Road,
Cairnhill, Airdrie.

Are our covers the type to "put people off"?

HYPNOTISM

Having been an S.F. fan for some years, and also a student of hypnosis, I have always been disappointed when hypnotism has been used in a story. The reason is that none of the authors seem to know much about the facts, and if they do, they disregard the possibilities of the science, for a science it is.

For instance, here are a few facts. Nobody can be hypnotised against their will. It isn't a matter of a stronger mind against a weaker one. The more willpower and intelligence a person has, the better subject he will be—but only if he is a willing subject. Also, a subject cannot be made to do anything against his or her morals,

religion or self-preservation. Imbeciles, idiots and morons are either impossible or most difficult to hypnotise.

Now for a possibility, ESP, for instance. Research is being carried out on this all over the world, using hypnosis for obtaining higher ESP than is normally found while a person is in a normal, conscious state. By using hypnosis one is able to train a person who has no sign of ESP to become quite a good ESP subject.

You must realise that I have just touched on the subject of hypnosis, but please, all you authors or would-be authors, if you must use hypnotism in your stories, then look up the facts, and from these you'll be able to see the possibilities. There are many good books on the subject and, if anyone is really interested in hypnotism, I am always willing to oblige, and so is any other hypnotist.

Here's wishing *Authentic* all the best, and congratulations on being the finest S.F. magazine yet.

J. L. B. Paterson, 71 Adair Road,
Eastney, Southsea, Hants.

One of the most often repeated statements made in connection with hypnotism is that it is impossible to persuade a subject to do anything against his moral code. As it is extremely doubtful that any hypnotist knows just what the subject's moral code is, that statement is open to question. It is based on the fact that most subjects will come out of trance if commanded to do anything they do not want to do.

But what if the hypnotist, by suggestion, persuades the subject

that it is to his welfare to follow a certain command? A female subject, for example, who is told that her clothing is on fire would tend to follow the dictates of survival rather than those of her moral code. Instinct would prompt her to remove the burning garments and so over-ride her moral objection to disrobing in public; a command she would refuse.

QUERY

It strikes me as being very curious that, although machines, standards of living and spaceships are constantly improving in your stories, mankind remains exactly the same. Isn't it about time that some of your authors, instead of showing the depths of degradation men can go to, write about the glories that are in human nature? A nature which is always changing with environment. Do you honestly think that a man of Dale Amber's calibre—*Number 13*, issue 69, by Douglas West—would be allowed to exist and be in charge of costly rockets and men's lives? Or do you consider that your readers are entitled to some intelligent science fiction?

I have read *Authentic* since issue 19, and in all these 50 issues I can honestly say that, apart from the above story or the like, I have enjoyed them all. Having ended its infancy and adolescence, *Authentic* has blossomed into an educational magazine of science fiction, something, I think, to be proud of. Please take note of my one and only criticism though.

Mike Kaye, 10 Forburg Road,
London, N.16.

I think West was justified in basing his character on real life. Amber bought and operated rocket ships with his own money and hired men who could, and did, refuse to fly them. Both Amber and his men were operating in a system of free enterprise. Would you prefer to live in any other system? Intelligent science fiction, yes, but can't it also be adult and realistic?

HE DISAGREES

Maybe No. 68 is not the perfect issue, but it comes as near to it as any issue yet published. First of all the cover which, naturally, is the first thing the reader sees. I can truthfully say that it's the best you've had since that beauty of the first spaceships approaching Mars way back in the *Earth to the Stars* series. One small point; aren't the crew of the rocket going to be rather intoxicated when the globes of whatever it is hit objects and split into smaller and smaller droplets? This will be the first time in history when alcoholics are breathed instead of drunk!

Next comes your editorial, and I'd like to disagree with you. Admitted, if a story were written today describing the invention of the aeroplane or submarine it would not be science fiction. But if the story were written when such inventions were not even thought of seriously, much less constructed, then surely it would be science fiction. Even today most of the works of Wells and Verne, such as *20,000 Leagues Under the Sea*, *The Land Ironclads*, *The War in the Air*, etc., can still be so regarded.

The best story in 68 was *The Deciding Factor*. It was not a nice story by any means, but very, very thought-provoking. Next, in my opinion, came *The Letter*, while *Cure for Dreamers* and *Mr. Culpeper's Baby* tied for third place. *Secret Weapon* was rather long, but still quite readable. The only item I found below par was *According to Tradition*, which seemed rather pointless. On the whole, the stories were widely varied and made interesting reading.

The articles? To the point and not too many of them, Mr. Campbell's being outstandingly good. I'm glad to see those vague photographs have been omitted and more space devoted to other features. If *Authentic* continues to improve as steadily as it has been these last few issues, we'll be able to forget about the "duds" of the preceding few months, which, coming from me, is praise indeed. George Powell, 73 Bath Road, Houndslow, Middlesex.

Shall we call it a play on words? Wells and Verne didn't write science fiction because the term was not then in use. Their stories today, to a new reader, would be classed as fantasy rather than science fiction—the new reader knows more about aeroplanes, etc., than the authors did. But to the old guard, who cut their teeth on

the books of Wells and Verne, they are, and always will be, regarded as S.F.

CALLING PLATO!

I am a regular reader of *Authentic* and I must say that I think it by far the best SF monthly I have read. There is one point I would like to suggest—that you include a facts section, a page or two devoted to short news items of scientific interest over the month which one might miss in the daily papers.

One section of man's endeavours which is sadly neglected is the exploration of the sea-bed, which presents as many difficulties as flight into space. Great work has been carried out by a handful of divers using aqua lungs, etc., but their expeditions, efforts and discoveries get very little mention. How about giving some scientific facts about the great undersea world of ours, and the people who are unfolding some of its secrets?

Who knows? Atlantis may not be a myth.

F. Jarvis, 62 Lovelace Gardens,
Southchurch, Southend-on-Sea,
Essex.

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